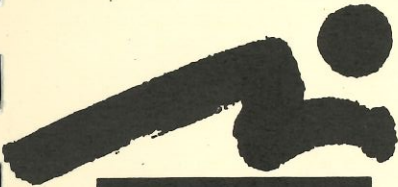


THE ARCHEOLOGY ON THE FARM PROJECT



**Lake Champlain
Basin Program**

**Improving Cultural Resource Protection on
Agricultural Lands: A Vermont Example**

**Prepared by
Jack Rossen**

**for
Lake Champlain Management Conference**

May 1994

This demonstration report is the third in a series of reports prepared under the Lake Champlain Basin Program. Those in print are listed below.

Lake Champlain Basin Program Demonstration Reports

1. *Case Study of the Town of Champlain.* Yellow Wood Associates. October 1993.
2. *(A) Demonstration of Local Economic/Other Community Impacts.* Community Case Studies for Economic Plan Elements. The City of Vergennes, Vermont. Economic and Financial Consulting Associates, Inc. October 1993.

(B) Demonstration of Local Economic/Other Community Impacts. Community Case Studies for Economic Plan Elements. Appendix. The City of Vergennes, Vermont. Economic and Financial Consulting Associates, Inc. October 1993.
3. *The Archeology on the Farm Project.* Improving Cultural Resource Protection on Agricultural Lands: A Vermont Example. Jack Rossen. May 1994.

This report was funded and prepared under the authority of the Lake Champlain Special Designation Act of 1990, P.L. 101-596, through the U.S. Environmental Protection Agency (EPA grant #EPA X 001840-01). Publication of this report does not signify that the contents necessarily reflect the views of the States of New York and Vermont, the Lake Champlain Basin Program, or the U.S. Environmental Protection Agency.

THE ARCHEOLOGY OF THE FARM PROJECT
IMPROVING CULTURAL RESOURCE PROTECTION ON AGRICULTURAL LANDS:
A VERMONT EXAMPLE

by
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edited by
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Vermont State Archaeologist

A Cooperative Program Among

State of Vermont
Division of Historic Preservation
Agency of Development and Community Affairs

State of Vermont
Agency of Natural Resources

Otter Creek Natural Resources Conservation District

New England Interstate Water Pollution Control Commission

with the assistance of
the Soil Conservation Service

May 1994



Acknowledgements

This project succeeded through the efforts and helping hands of an enormous number of people. Special thanks go to a handful of people. Giovanna Peebles, the Vermont State Archaeologist at the Division for Historic Preservation, designed the project and skillfully watched over me as case studies developed, knowing both when to step in and when to leave me alone. She also discussed many of the ideas in the report with me, and edited the final version. Everyone should have as good a boss. Her unending enthusiasm for public archaeology and site preservation is a treasure for Vermont. The Lake Champlain Basin Program administered the project funding, and Lisa Borre, Tucky Ceballos, and Cathy Wolcott deserve special thanks for helping with the administrative tasks that I so poorly understand. The Basin Program should be commended for its foresight in including cultural resources in its broad conservation perspective of the Champlain Basin.

The Vermont Soil Conservation Service set a national example by participating in this project. John Titchner, State Conservationist, Fran Keeler, State Resource Conservationist, and Dr. Fletcher M. Potter, Environmental Specialist, actively participated in the project and provided detailed constructive comments on an earlier version of this report. At my home base, the Middlebury Field Office, the entire crew deserves special thanks for enduring an intensive dose of archaeology: now-retired District Conservationist Bob Collins, present District Conservationist Keith Hartline, and staff members Peter Lossmann, Randy Stearns, Tate Jeffrey, and Brenda MacDonald. These friends participated fully in the project and worked hard to develop fundamental paraprofessional archaeological skills. The SCS and general public can be extremely proud of this hard-working field office.

Substantive comments on an earlier manuscript version were made by James B. Petersen, University of Maine at Farmington, Peter Thomas, University of Vermont, and Karen Hartgen, Hartgen Associates. Their greatly appreciated thoughts and criticism forced me to rethink certain points and further explain others. Of course they are not responsible for the weaknesses that remain.

Numerous local organizations participated in the project and provided their insights into cultural resource protection. These are described in the report, but special thanks go to Audrey Porsche, Chimney Point Museum and Mount Independence director, Polly Darnell of the Sheldon Museum, Sandy Young, Director of the Regional Planning Commission, Linda Henzel of the Lewis Creek Conservation Committee, and Harvey Smith and Abbe Zito, activist members of the Regional Planning Commission. Other professional

archaeologists continually helped the project. Dr. Jeffrey Kenyon of the SCS National Technical Center in Chester, Pa., provided invaluable guidance, and twice visited Vermont to run the classroom workshops and inspect sites. He also provided invaluable comments on the early version of this report. David Skinas, Vermont Division for Historic Preservation, Todd Hannahs, Sheila Charles, independent archaeologists, and David Lacy, Shelley Hight, and Eric Bowman of the U.S. Forest Service were always there when needed for special field and outreach projects.

Langdon Smith was my best local expert on archaeology. He is a role model for conscientious private collectors who surface collect only, carefully document and catalog their artifacts, and donate information to the Vermont Archaeological Inventory. Gailer School (Middlebury) students Jacob Pierpont and Elias Benson volunteered tirelessly for several months, learning about the less glamorous aspects of archaeology and restoring my faith in the next generation.

The Addison County farmers deserve special recognition. They continually impressed me with their interest in Vermont's heritage and their insights into cultural resource stewardship. They actively helped me operationalize my messages: that site preservation is easy, and projects and progress are not halted by consideration of cultural resources. Because of the farmers' support and enthusiasm, I am optimistic about the prospects for preservation and research in western Vermont. The long-term management of cultural resources in Addison County (and the Champlain Basin) is for you and your children. Lastly, thanks go to my best friend Karin Hill for being here with me.

Jack Rossen

Middlebury, Vermont

June 23, 1993

Table of Contents

Chapter 1. Cultural Resources and the Archaeology on the Farms Project.....	3
The importance of cultural resources.....	3
Cultural resource protection and the law.....	4
The Archaeology on the Farms Project.....	7
Project methods.....	10
Chapter 2. The Soil Conservation Service, Project Results and Case Studies.....	13
Basics of cultural resource management.....	13
SCS organization and staff structure.....	14
The SCS cultural resource program.....	16
Patterns of SCS earth-moving.....	18
Perceptions of cultural resources.....	24
Information management and security.....	26
Selected case studies.....	28
Discussion.....	63
Chapter 3. Public Education and Outreach.....	64
Outreach to farmers.....	64
Outreach to local organizations.....	66
Outreach to collectors.....	71
Chapter 4. Discussion and Recommendations.....	75
Specific issues and recommendations.....	76
Public outreach recommendations.....	80
Concluding remarks.....	83
Part Two: Cultural Resources of Addison County, Vermont.....	84
Topography and hydrology.....	84
Summary of Vermont prehistory and history.....	87
Modeling the prehistoric archaeology of Addison County....	94
An example of an archaeological sensitivity model.....	109
Discussion.....	113
References Cited.....	115
Appendix 1. Further examples of public outreach to local organizations.....	119

List of Figures

1.1 Review and compliance steps for Section 106 of the National Historic Preservation Act of 1966.....	5
1.2 Review and compliance steps for Vermont Act 250.....	6
2.1 General views of foundation at site VT-AD-706.....	33
2.2 Plan of site VT-AD-706.....	35
2.3 Shipping catalog of Bissell Merino sheep (1890).....	38
2.4 Shipping catalog of Bissell Merino sheep (1897).....	39
2.5 Cover of in-house promotional pamphlet on Bissell Farm.....	40
2.6 Portrait of E.N. Bissell (1840-1917).....	41
2.7 Tile line construction at site VT-AD-706.....	46
2.8 Disturbed stratigraphy and backdirt at site VT-AD-706.....	47
2.9 Cut stone blocks of underground waterways.....	48

Part II

II.1 Location of Addison County in west-central Vermont.....	88
II.2 Detail map of Addison County with rivers and lakes.....	89
II.3 Generalized artifact typology of Vermont prehistory.....	92

List of Tables

2.1 Middlebury SCS field office projects 1991-1993.....	20
2.2 SCS projects and archaeological sites by watershed.....	20
2.3 Summary of 1992 SCS earth-moving projects, Addison County..	23

Part II

II.1 Site area, Addison County recorded sites.....	99
II.2 Site density, Addison County recorded sites.....	99
II.3 Topographic setting, Addison County recorded sites.....	99
II.4 Immediate setting/present land use, Addison County sites..	101
II.5 Drainage system affiliation, Addison County sites.....	101
II.6 Archaeological site frequencies by watershed.....	101
II.7 Recorded archaeological site density by watershed.....	102
II.8 Perceived threat to sites, Addison County.....	102
II.9 Soil types and site probability coefficients.....	106

Introduction

The Archaeology on the Farms Project of 1991-1993 was a multidimensional effort to record, evaluate, interpret and preserve cultural resources on farms in Addison County, western Vermont. Archaeological resources were the primary focus, although consideration and protection of standing historic structures was also included. Conceived and directed by Giovanna Peebles, State Archaeologist, and funded by the Environmental Protection Agency (EPA) through the Lake Champlain Basin Program, the project worked with a variety of organizations on cultural resource protection issues. The effort focused on the Soil Conservation Service's (SCS) Middlebury Field Office, examining patterns of SCS earth-moving projects, their effects on cultural resources, and the development of a best-practices approach to cultural resource protection during SCS projects.

The project has also been a broad-based effort to raise public awareness of the importance and fragility of cultural resources at the town, county and state levels. The various project activities are united under the general theme of planning and protection for cultural resources through any innovative means possible. The "means" involved the novel presence of a professional archaeologist in a high-profile rural community office, which resulted in a large amount of stewardship and conservation work.

Addison County, Vermont (overviewed in Part 2) contains a landscape of picturesque historic villages, covered bridges, apple orchards, and almost 400 dairy farms. The county stretches from the 4000 foot peaks of the Green Mountains in the east to the shores of Lake Champlain in the west. Included are a major river valley (Otter Creek), several other major tributary rivers and river valleys, and Pleistocene ponds with long-stable shorelines. The county also contains one of the densest concentrations of cultural resources in New England. Over 300 historic archaeological sites have been recorded, and a comprehensive list of National and State Register buildings has recently been compiled and published (Johnson 1992). Several villages are listed as National or State Register Districts. Over 400 prehistoric sites have been recorded in the county, and as will be discussed in Chapter 2, countless more remain to be found. The Archaeology on the Farms Project focused on this county because of its dense concentration of cultural resources and the presence of the busy SCS Middlebury Field Office.

Chapter 2 also discusses legal mandates for considering cultural resources, particularly when federal funds or technical assistance are involved. The SCS organization in Vermont is examined, along with the present system of cultural resource protection. The SCS is travelling a path previously trod by other land-altering federal agencies, such as the U.S. Forest

Service, which have struggled to deal with cultural resource issues. Vermont SCS personnel understand the need and requirements for a meaningful system of cultural resource protection. A full understanding of the spectrum of issues and requirements necessitated a thorough study of SCS earth-moving patterns and its resulting effects.

Chapter 3 explains the distinctive patterns of SCS earth-moving that may be unique to this county, and how SCS earth-moving farm projects endanger or directly impact cultural resources. Particular types of projects, such as diversion ditches and streambank stabilizations (ripraps), are far more likely to endanger cultural resources than other projects such as manure pits. Eleven farm projects (out of 86 total projects) were chosen for presentation in Chapter 3, and each case discusses a specific cultural resource issue and the SCS response. Most importantly, these case studies illustrate the range and complexity of cultural resource problems that an SCS project can potentially produce, and the challenges presented by cultural resource protection in the SCS.

During the course of this project, it became evident that a professional archaeologist stationed in a rural SCS office can also have an important influence on a variety of local groups and organizations. Some of these activities are discussed in Chapter 4 and treated as ancillary to the primary goals of examining and assessing SCS project effects on cultural resources. Becoming involved with Addison County communities was in many respects the most rewarding aspect of the project. The local involvement may also prove to be the project's most enduring legacy. Finally, Chapter 5 provides a discussion to place the project in the perspective of its successes and limitations. Described are the multiple roles and broad advocacy that are important to establishing and reinforcing an ethic of cultural resource protection where little previously existed. Also discussed are the limitations of any project which is based on only a temporary presence in a region.

Specific issues and recommendations are also addressed in Chapter 5. Certain types of communication, enforcements and incentives are necessary for cultural resource protection to be a long-term reality in Addison County, or anywhere else in the Champlain Basin. Hopefully, some of the broader messages are applicable to regions beyond Addison County and Vermont. The need for institutionalizing cultural resource specialists in SCS and the more general need for a regional presence of these specialists are discussed. The issue of cultural resource protection arises in innumerable community contexts, and thus, no specialist can lock themselves within an office (SCS or otherwise) and not face the broader contexts, including those of schools, citizen conservation groups, recreational organizations, special interest groups and town/regional planning.

Chapter 1. Cultural Resources and The Archaeology on the Farms Project

The Importance of Cultural Resources

Cultural resources such as historic buildings, structures, and archeological sites are a direct link with our past. Much has been written about the broad appeal of archeology and history, but perhaps that link is the key. In Vermont, the landscape contains archeological traces of Euro-American industry and farming that have disappeared, such as the powerful and wealthy 19th century Merino Sheep industry, and the lime and charcoal industries. Prior to the arrival of the Euro-Americans, Vermont had an 11,000 year prehistory of Native Americans who arrived as the glaciers receded and, through time, developed a diverse plant gathering, hunting and fishing economy; eventually, they shifted to agriculture. During this prehistory, there were cycles of external contact and local isolation.

For studying the historic Euro-American period, there are archives containing letters, records and photos, and the historic buildings themselves tell a story. But as will be seen in Chapter 3 in discussing the Farm #62 project, there are important gaps in our historic knowledge that only research on archeological sites can potentially fill. In the case of prehistory, archeological sites are the only source of information about this very long portion of human history. If these sites are not protected, a region's heritage is lost. Brian Fagan (1985:11) has written about the "collective cultural heritage" that archeological and historic sites together represent. According to Fagan, these sites are important to a nation, first, as elusive (but recoverable) chapters of history and, second, as insights into the different, perhaps simpler and more natural societies of the past.

If cultural resources represent a link between people and the past, the link between knowledge of the past and present is the social science of archeology. Detailed archeological research at a site, and the following laboratory work, analysis and writing may involve scientists from as many as 40 disciplines. Modern scientific archeology is one field of study where a broad spectrum of scientists may interact. Archaeological sites are in Fagan's words (Ibid.:13) "storehouses of information for a host of natural and physical scientists."

Because of their value as cultural and scientific storehouses, the destruction of cultural resources such as archeological sites is an irreplaceable loss. Archaeological sites are fragile and non-renewable resources. Across the U.S., archeological sites are disappearing at a rapid and alarming

rate. Land development and uncontrolled excavation by unqualified individuals and looting are the most highly publicized causes of site destruction. Erosion of lakeshores and streambanks is also destroying archeological resources at a rapid rate. Standard farming practices can also nibble away at archeological sites. As will be discussed in Chapter 2, even in a heavily rural region like Addison County, Vermont, most archeological sites are under threat of destruction. Because so little scientific research has occurred in the area, the destruction of sites means the near total loss of the stories of the region's past. Vermont State Archaeologist Giovanna Peebles (1989:3) concludes that, "As more and more of Vermont's archeological resources are destroyed, we are increasingly concerned with preserving our remaining archeological heritage and improving our knowledge of those threatened resources."

Cultural Resource Protection and the Law

Some limited legal protection exists for cultural resources. Under Section 106 of the National Historic Preservation Act, projects that are federally funded, assisted, licensed or permitted must consider, locate, and, if warranted, evaluate and preserve cultural resources in a project area. Figure 1.1 summarizes how this process works and clearly indicates that the involved federal "Agency" is responsible for implementing this process. Act 250 (Title 10 of Vermont Statutes Annotated, Chapter 151) and the Vermont Historic Preservation Act (Title 22 of Vermont Statutes Annotated, Chapter 14) also mandate consideration of historic and archeological resources at the state level in a variety of circumstances. Figure 1.2 illustrates the options for considering archeological sites during the review process. Archeological sites that are located during this process can be avoided through project redesign, or if avoidance is not possible, the site is evaluated by a professional archeologist. If the site is determined to be significant (that is, eligible for the National or State Register of Historic Places), data recovery by scientific excavation may be required.

In the wake of legal mandates to protect cultural resources when there is federal involvement, various federal agencies discovered that, as earth-movers, they too had to develop appropriate strategies for complying with Section 106 and for considering cultural resources during project planning. For example, both the U.S. Forest Service and the Bureau of Land Management eventually incorporated professional archeologists on staff to most efficiently carry out their cultural resource responsibilities.

Figure 1-1. Review and compliance steps for Section 106 of the National Historic Preservation Act of 1966.

THE BASIC STEPS OF SECTION 106 REVIEW

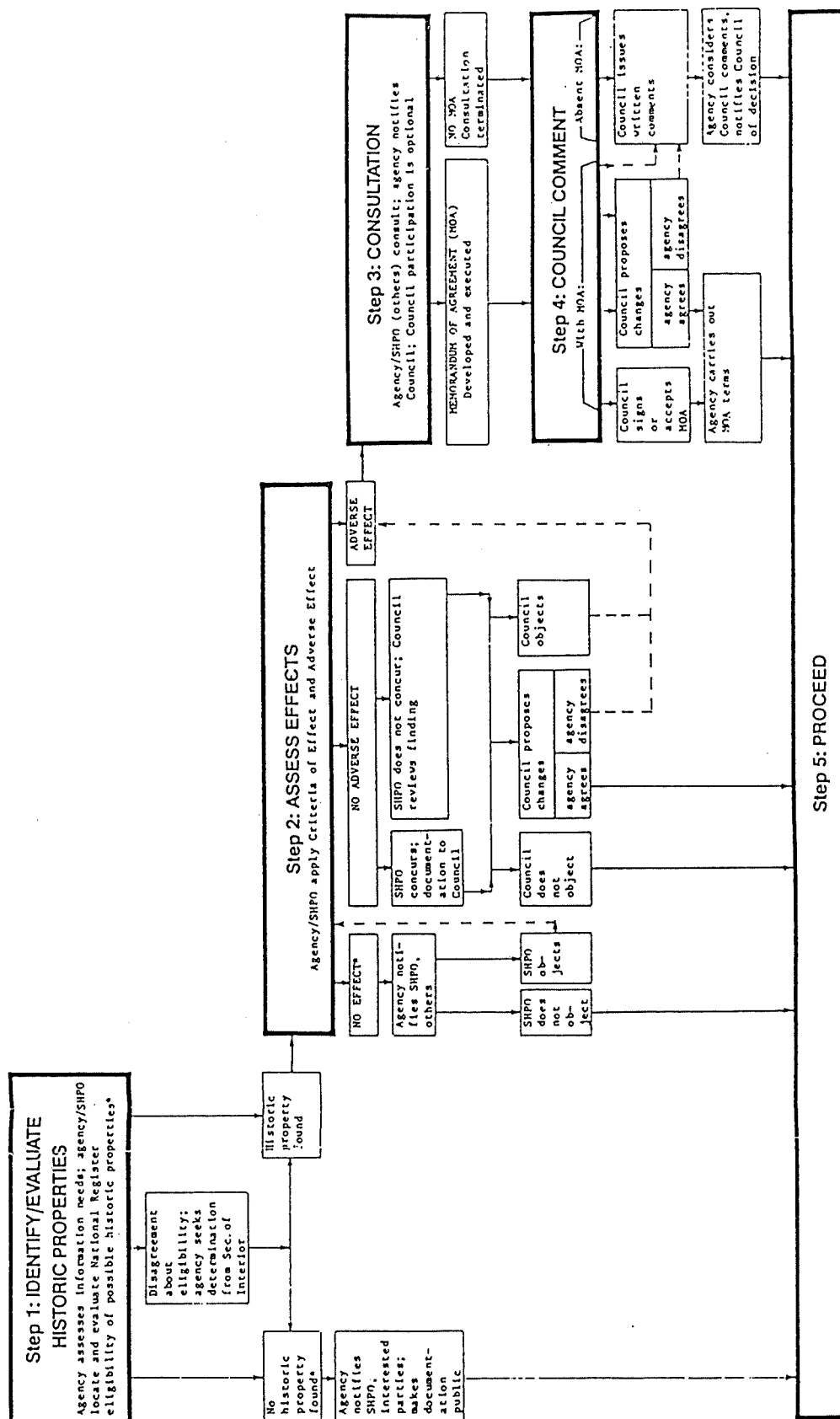
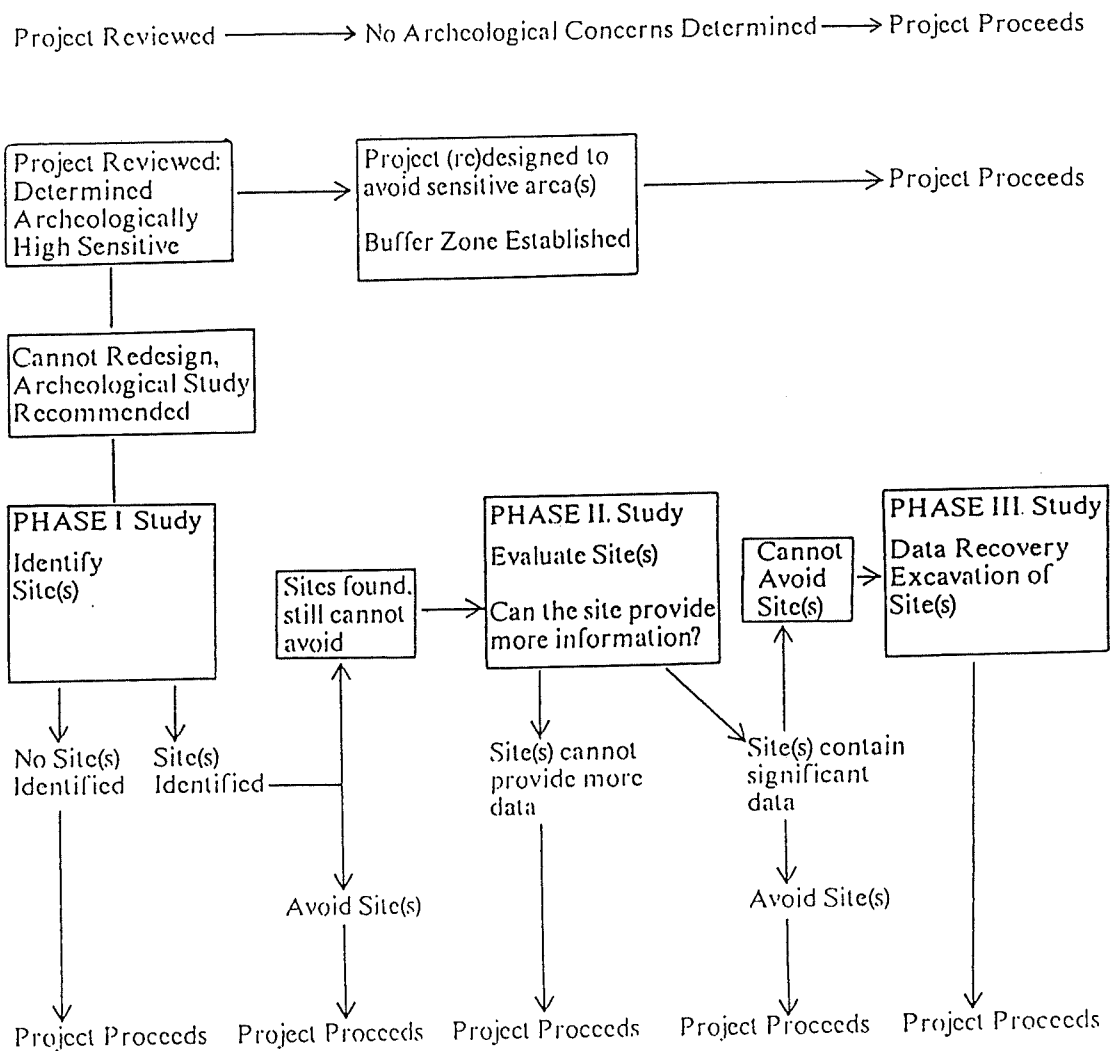


Figure 1-2. Review and compliance steps for Vermont Act 250.



Vermont Division For Historic Preservation

Management Options For Archeological Concerns



All archeological studies must be conducted by qualified consultants.
All archeological studies must follow the Division's Guidelines for Conducting Archeological Studies in Vermont.

The Archeology on the Farms Project

Improving the water quality of Lake Champlain is a priority for the states of Vermont and New York. To implement this, significant monies are being provided to farmers for treating agricultural waste and other sources of non-point pollution. Numerous program commitments by both federal and state agencies have been made to implement projects that help stem the tide of non-point pollution. These projects, however, result in a potential conflict: improving water quality may result in the destruction of other resources such as cultural resources.

The Vermont office of the Soil Conservation Service (SCS), the Vermont office of the Agricultural Stabilization and Conservation Service (ASCS), and the State of Vermont's Division for Historic Preservation (VDHP) spearheaded discussions to address their concerns that land-disturbing farm treatment projects have a very high potential for destroying important archeological sites, and potentially, historic agricultural buildings such as barns. The Otter Creek (Vermont) Natural Resources Conservation District, through the Vermont Natural Resources Conservation Council (VNRCC), was brought into these discussions. Initially, the New York Office of Parks, Recreation, and Historic Preservation (OPRHP) and, subsequently, the New York State Archaeologist's office were also brought into this discussion and agreed that a pilot project in Vermont to begin to address these issues would be of interstate benefit.

By increasing the dollars that may be available for water quality projects, the Lake Champlain Special Designation Act magnifies the potential for destroying more of the Champlain Valley's rich and diverse archeological resources. Due to the accelerated influx of monies for water quality projects and ensuing conflict with archeological resources in the course of their implementation, innovative and proactive strategies are needed to ensure protection of these vulnerable, irreplaceable resources.

Project Origins and Goals

Project funding was secured through the Lake Champlain Basin Program (LCBP). In that organization's own words:

The Lake Champlain Basin Program is a result of the Lake Champlain Special Designation Act of 1990, which recognizes the lake as a resource of national importance. The Act establishes a 31-member Management Conference, which has been charged with developing a comprehensive pollution prevention, control and restoration plan for Lake Champlain. Federal, state

and local government officials, legislators and representatives from industry, education, non-governmental organizations and the general public participate in the program. Each year, federal funds are appropriated to carry out research, demonstration, monitoring, planning and educational activities related to the development of a clean-up plan for Lake Champlain. The ultimate goal of the LCBP is to insure that the lake and its drainage basin will be protected, restored and maintained so that future generations will enjoy its full benefits (Lake Champlain Basin Program 1993:12).

The Lake Champlain Special Designation Act and the accompanying congressional intent made a point of including cultural resources in the comprehensive plan for the Champlain Basin. The Archeology on the Farms Project was funded as a demonstration project with multiple goals. The following project goals were specified in the project work plan:

1. Enhance the protection of archeological resources in the Champlain Basin;
2. Recommend new and/or improved strategies for helping the SCS and the ASCS improve protection of archeological resources;
3. Enhance SCS and ASCS staff's and farmers' awareness of archeological resources on Champlain Basin farms;
4. Establish and facilitate a greater level of involvement, cooperation, and discussion among New York State and Vermont historic preservation personnel, archeologists and cultural resource specialists;
5. Assist the Management Conference in developing the Lake Champlain Pollution Prevention, Control and Restoration Plan by identifying actions needed to maintain (or enhance) the cultural (and related educational and recreational) values in and on the lake, and in other tasks during Plan development. The project work plan tasks reflected the multidimensional nature of the demonstration project, including specific work with the SCS, but also integration with the community and its many civic and private organizations.

A sample of work tasks included:

1. Carry out limited field work on a minimum of 20 farms to evaluate and refine specific models for locating archeological resources on Addison County, Vermont, farms;
2. Interview farmers, SCS and ASCS personnel, local artifact

collectors and historians to identify known but unrecorded sites;

3. Synthesize and refine existing predictive models of site location. Develop a more reliable or accurate model(s), if appropriate, for use in the Champlain Basin;

4. Evaluate proposed SCS/ASCS projects for their effects on archeological resources;

5. Evaluate how compliance with Section 106 of the National Historic Preservation Act is being carried out in real-life practice in the Champlain Basin;

6. Recommend new ASCS/SCS policies, procedures, funding and/or staffing at the local and state levels;

7. Develop and carry out training programs for SCS staff to enhance resource awareness and minimize conflicts;

8. Develop and implement public outreach programs for Lake Champlain farmers and towns to enhance public awareness of archeological and other cultural resources.

Project Organization

The project was organized and implemented as a cooperative program among the State of Vermont Division for Historic Preservation (Agency of Development and Community Affairs), the State of Vermont Natural Resources Conservation Council (Agency of Natural Resources), and the Otter Creek Natural Resources Conservation District for the Lake Champlain Management Conference. Funding was provided by the U.S. Environmental Protection Agency, with matching in-kind funds provided by a variety of sources, in particular, the Otter Creek Natural Resources Conservation District, project consultants, volunteers, and project reviewers. VDHP responsibilities included planning and directing the project, providing programmatic and on-going guidance and work supervision, reviewing various quarterly interim reports and, of course, this final report. The SCS participated wholeheartedly in all phases of the project.

Being an EPA-funded archeologist, directed by the VDHP, and working, essentially, for the SCS had both its advantages and disadvantages. Direction by VDHP provided an on-going source of advice, guidance and a variety of technical expertise to the project. The situation within an SCS field office provided a close, first-hand (virtually ethnographic) view of SCS activities. There were certain disadvantages to being in an office with different work goals, however. At times, there was a perception of working against or obstructing SCS projects, or worse, of being an "outsider" placed within the agency. These

problems lessened with time and increased familiarity of SCS personnel with the project. The change in attitude at the SCS field office, from caution to guarded interest to participation in the project, will be subsequently discussed in detail.

Project Limitations

The Archeology on the Farms Project was conceived as a interstate project focused in Addison County, Vermont, but with some tasks performed in New York. Unfortunately, for various reasons, New York state chose not to participate in the project as it evolved. One meeting was held in Albany with representatives of VDHP, New York Office of Parks, Recreation, and Historic Preservation, and New York SCS. This interstate group constituted the broader project team that was sent quarterly reports throughout the project and had the opportunity to review the final project report.

The inclusion of New York in the project would have been desirable if only because the cultural resources of the New York side of the Lake Champlain Basin are even less understood than those of the Vermont side. For example, Lake Champlain has been viewed by some archeologists as having been a prehistoric cultural boundary between Iroquoian and Algonkian-speaking groups. This idea has not been tested through archeological research. A complete view of Vermont prehistory or history thus requires information from both sides of the basin.

A second limitation of the project was the failure to involve the Abenaki Nation as the project moved forward. As Vermont's main Native American group, the Abenakis have a special interest in archeological research and resource management and protection. Meetings and on-site visits with representatives of the Abenaki Research Project were written into the original project work plan. Due to limitations of time and the distance of Addison County from the Abenakis' primary living area (in Franklin County), active participation by the Abenakis was not realized. However, members of the Abenaki Research Project received quarterly reports during the project, drafts of the final report, and will receive copies of the final report.

Project Methods

The project methods included a variety of standard archeological and ethnographic techniques. To locate archeological sites, standard field surveys were conducted on farms, including walkovers of plowed fields and shovel testing at regular (8 meter) intervals where ground cover was present. Soil from shovel tests was carefully examined for color, texture, artifacts and other signs of cultural alteration. When sites

were located, a small representative sample of diagnostic artifacts was collected. Diagnostic artifacts are objects such as projectile points or historic decorated ceramics which allow a site to be roughly placed in time and/or provide significant information on activities which occurred at a site. When necessary, State and National Register eligibility was assessed in accordance with specific state and federal criteria.

Ethnographic techniques included interviews with farmers and local artifact collectors. Certainly, participant-observation in the Middlebury SCS Field Office was important to understanding the broader SCS cultural resource issues and problems, and for making practical recommendations. In general, project public outreach involved the observation of and participation in community conservation and planning organizations to understand how they operate and what their perspectives are on cultural resources.

A file was kept on each farm or other location visited, each person interviewed, and each organization worked with. Unrecorded archeological sites were documented on standard Vermont Archeological Inventory site forms. Files were kept on recorded sites that were visited, assessing their present condition and including any additional information collected. Short analytical papers and research reports concerning particular issues, case studies, or citizen groups were also written during the project. Standard quarterly progress reports were submitted to the Lake Champlain Basin Program, and to the broader project team and interested individuals. All files and project papers are curated at the Vermont Division for Historic Preservation in Montpelier.

Artifacts collected from sites are the property of the landowners. When landowners desired it, these artifacts were returned to them. When landowners gave permission, the small diagnostic collections were cataloged, analyzed and curated.

Identification of historic structures was tremendously facilitated by having a published comprehensive survey of Addison County's historic structures (Johnson 1992). On each farm, historic structures were noted in the project file. Specific issues involving historic barns and the project contacts with the National Trust for Historic Preservation's "Barn Again!" Program will be discussed in Chapter 4.

Previous Pilot Project in Franklin County

A brief pilot Archeology on the Farms Project was implemented in 1990 by VDHP and Vermont SCS in Franklin County, two counties north of Addison County, and also in the Champlain Basin. The project provided much useful background information

on the structure of SCS and the types of projects it conducts (Garman 1991). Although Franklin County has a relatively high site density, project archeologist James Garman recorded no sites in SCS project areas. This resulted in a misleading impression that SCS projects rarely impact cultural resources. Many projects could only be visited once construction had already begun. Furthermore, there was little time to reflect on the complex implications of the report, to develop relationships with state SCS officials, and to discuss key issues. The project was simply too brief to adequately address the impact of SCS projects on cultural resources in a single agricultural Vermont county.

The subsequent long-term demonstration Archeology on the Farms Project learned from and avoided some of the pitfalls of its predecessor. The eighteen month tenure allowed for the development of cohesive relationships among the project personnel and the SCS field office staff and key state office personnel. It also allowed me to spend a winter in the office before construction projects were implemented so I could become familiar with SCS activities and prioritize projects. This greatly reduced (although did not eliminate) logistical problems with accessing project areas before construction. The longer project tenure also gave SCS personnel (particularly in the field office) more time to learn about and reflect on the importance of cultural resource protection and to develop practical methods for day-to-day incorporation of cultural resource considerations into their existing routines and workload.

Chapter 2. The Soil Conservation Service, Project Results, and Case Studies

The Basics of Cultural Resource Protection

The national and state legal mandates for consideration of cultural resources were briefly reviewed in Chapter 1. The ideal mechanics of this "consideration" include the following:

1. A check of existing records and site files to determine if previously recorded sites are present in a project area.
2. A walking survey of the project area. If the land surface is vegetated or otherwise disturbed, shovel tests are excavated at predetermined intervals. In Vermont, the Division for Historic Preservation's Guidelines for Conducting Archeological Studies (Peebles 1989) recommend a maximum interval of eight meters between test pits. Soil horizons may be examined, and excavated sediment may be thoroughly examined and, usually, screened (depending on field and sediment conditions). Shovel tests may not be necessary when the ground is bare or plowed.
3. Identified sites are recorded on standard Vermont State Archeological Inventory site forms.
4. An attempt is made to redesign a project to avoid the site(s).
5. If a site cannot be avoided, the identified site(s) is evaluated for "eligibility" for inclusion in the National Register of Historic Places. Criteria for determining eligibility include site integrity and potential to provide significant cultural or scientific information. In some cases, a systematic test excavation, designed to determine nature, depth and intactness of the site may be necessary to determine site significance. Sometimes, a site can be adequately evaluated based on surface evidence only if site size, characteristics, possible data content and general integrity is apparent.
6. If a site is determined to be eligible for inclusion in the National Register and cannot be avoided by project redesign, other alternatives are sought to lessen the project's impact to the site. One alternative is excavation (or "data recovery") of the site prior to its whole, or partial, destruction by the project. In this case, data recovery is considered "mitigation" that cancels out the negative effect of destroying a significant site. Figure 1.2 in Chapter 1 illustrates the basic options for considering archeological sites during project planning.

SCS Organization and Staff Structure

A brief description of SCS organization and structure is necessary to understand much of the discussion that follows. Funding for SCS earth-moving projects in Vermont comes primarily from three sources: the ASCS, the Agricultural Conservation Program (ACP) and the SCS Watershed Program. The dispersed field offices provide Farm Plans for cooperating farmers. Farm Plans are binding if federal loans or benefits have been received. These plans include specifications for crop rotation and restrictions on the use of highly erodible fields and wetlands. Within a plan, a Long Term Agreement (LTA) prescribes an implementation schedule of federally cost-shared conservation projects over a period of as many as seven years. For example, the additions of a waste storage (manure) pit and diversion ditches for eroding fields may be mandated. Farmers may also sign-up for special project funds. Finally, SCS responds to requests for technical assistance on non-SCS planned or cost-shared projects at farms, schools, businesses and residences.

An SCS Field Office is the primary implementing unit. The Middlebury Field Office has a District Conservationist, a conservationist, an engineering technician, and two soil technicians. All Middlebury Field Office employees are involved in the planning, design and construction of projects in the field. Farmers hire private contractors for earth-moving, and construction is monitored or checked by SCS personnel. Field Offices are allowed substantial independence in project planning, design and implementation, although projects must comply with established policy and design standards. This agency decentralization is an important factor when designing a suitable cultural resource protection system, as subsequent discussions and case studies will demonstrate.

SCS Policy

SCS policy on cultural resources is contained in their General Manual 420, Part 401. This eleven page section recognizes the legal mandates of Section 106 of the National Historic Preservation Act, makes a policy statement, and pledges to implement cultural resource management (CRM) practices without explaining how this is to be accomplished. The most important policy statements are as follows: "SCS recognizes that historic properties are an integral part of our national heritage. Protection of these properties requires careful consideration in SCS assistance programs. SCS will promote the conservation and protection of historic properties in its programs for conservation of soil, water, and related resources." "SCS will identify and protect historic properties early in the planning and environmental evaluation phases of all assistance

activities." "SCS will inform participants about the importance of the cultural environment..." "SCS will provide training to field personnel...to ensure maximum consideration of historic properties." Under the subtitle "SCS administrative responsibilities" are included the following statements: "Area and district conservationists are responsible for identifying and avoiding adverse effects on historic properties and for recommending opportunities to enhance them as appropriate during SCS assistance activities." "SCS will identify historic properties...and determine whether they may be eligible for the National Register of Historic Places." "SCS will determine the significance of properties identified...by applying the National Register of Historic Places criteria of evaluation. For each property that meets NRHP criteria, SCS will request concurrence from the State Historic Preservation Officer."

The above General Manual quotations provide a useful context for beginning to analyze and evaluate the SCS cultural resources program. It should be noted, however, that the General Manual policies on cultural resources are now undergoing significant revision. This is a positive development, because current nationwide SCS policy dedicates no funds for hiring archeological consultants. The current SCS policy makes no provisions for utilizing cultural resource specialists like archeologists, except through consultation with the State Historic Preservation Office (SHPO) after a site has been found and recorded. Thus, the General Manual currently requires SCS personnel to conduct activities they are unqualified to perform. Site recognition, documentation and, especially, evaluation of significance are complex and time-consuming practices that require years of specialized training and experience. This requirement becomes even more unrealistic in view of the heavy workload already carried by SCS field offices.

Additionally, many important procedures and issues are not currently addressed by the General Manual. For instance, there are not yet specific prohibitions against artifact collecting by SCS staff, or procedures for security of site location information. The upcoming revisions of the General Manual thus offer a tremendous opportunity to provide guidance at the general policy level and to state explicit procedures involving cultural resources.

In recent years, the SCS operated under a nationwide Programmatic Agreement with the National Conference of State Historic Preservation Officers (NCSHPO). Under the agreement, each state appointed a "cultural resources coordinator," and a system of training programs was designed and instituted in order to qualify field personnel to recognize and record sites. This system of coordinators and training programs is discussed next. A new updated national agreement, to be supplemented at each state level, is nearing completion.

The SCS Cultural Resource Program

The SCS cultural resource program currently consists of a state Cultural Resources Coordinator and a classroom workshop and field training program in cultural resources for field personnel. "Cultural Resources Coordinator" is an ancillary duty for someone already employed by SCS, often a specialist in wetlands ecology or economics. Job responsibilities are to administer cultural resource efforts at an SCS state office and to act as liaison with the State Historic Preservation Office. In Vermont, Dr. Fletcher Potter, an environmental specialist, is the cultural resources coordinator, and he communicates with Giovanna Peebles, State Archaeologist, at the Vermont Division for Historic Preservation.

The primary limitation of this system is that most Cultural Resource Coordinators are untrained in archeology, with the possible exception of a brief workshop or two. The SCS cultural resource training programs consist of two days of classroom instruction which includes seven modules. Each module has a video plus supplementary lecture and workbook exercises. SCS has an archeologist at its Northeast National Technical Center who advises states about cultural resource issues and teaches the classroom workshops. Dr. Jeffrey Kenyon, an archeologist stationed in Chester, Pennsylvania, is responsible for thirteen northeastern states including Vermont and New York.

At the commencement of the Archeology on the Farms Project in November of 1991, the centrally instituted training workshops had not been conducted in Vermont. Some formal training was conducted by the State Archaeologist and, for individual field offices, by other professional archeologists consulting for SCS as a result of specific watershed programs. On one project in Addison County, the State Archaeologist herself conducted test excavations where a manure pit was to be placed on perhaps the most well-known prehistoric site in the county. Other than that, no sites had ever been recorded and no cultural resource actions had been taken.

Through the efforts of the SCS, this project, and the Vermont Division for Historic Preservation, Dr. Jeffrey Kenyon conducted the formal 2-day SCS cultural resource training session in Vermont in January, 1993. (This program had been conducted in New York in January, 1992). By the time of the Vermont session, the nationwide Programmatic Agreement had been cancelled by the NCSHPO. The Vermont training program was designed to sensitize SCS staff about cultural resources and federal agency obligations, and to begin to learn to identify and avoid sites.

The classroom workshop contains many useful points for understanding why certain landforms are much more likely than others to contain prehistoric sites, and information on site

recognition. The workshops were particularly useful in explaining how a particular state is set-up for reviewing projects and dealing with cultural resource issues when they arise. As such, they promote communication between SCS and state preservation officials. Also, by having someone from the SCS's own technical center present the workshop, many resource and compliance issues were reinforced to the statewide staff. Dr. Kenyon strongly reaffirmed SCS's policy of identifying and protecting cultural resources during project implementation. The classroom workshops were followed up with a one-day field training session for all Vermont SCS field staff.

One session each was held for eastern and western Vermont offices, during which staff visited both prehistoric and historic sites with me and David Skinas, Survey Archeologist with the Vermont Division for Historic Preservation. During these sessions, SCS staff were able to see prehistoric lithic scatters, prehistoric hearths and living floor eroding from a riverbank, and historic foundations and cellar holes. The sessions emphasized practical field recognition of various common types of archeological sites.

Limitations of the Workshops

While the training workshop shed welcome light on cultural resource issues, there are also serious limitations based on their original intent. When first conceived by the national SCS, there was an expectation that a brief workshop could replace years of training and experience, and that they would enable SCS to handle many cultural resource responsibilities internally without true specialists. These expectations are unrealistic, and SCS personnel readily recognized this when, during the Vermont workshop, they repeatedly asked questions such as, "Wouldn't it be much easier for everyone if we just hired a few archeologists?" Specifically, there is a problem in expecting SCS personnel to be able to reliably identify, define and report sites on the basis of brief workshops. There are indications in the Middlebury Field Office, however, that with increased repetition and longer-term contact with a professional archeologist, some SCS personnel can develop true archeological paraprofessional skills.

Another problem is that there exists no reliable system of follow-up checks to gauge the effectiveness of the training programs. That is, sites should be discovered and reported by SCS personnel if the workshops are effective. Because of the Archeology on the Farms Project, Vermont is probably not a reliable forum for assessing the effectiveness of the workshops. Certainly the workshops greatly increase staff awareness of cultural resources, preservation laws and the variety of issues involved. There are serious concerns, and perhaps passive

resistance, to taking on cultural resource responsibilities among SCS personnel. This is a complex issue that does not necessarily reflect a negative attitude towards cultural resources. Instead, it appears to reflect concerns with the extra workload and responsibility being passed on to already overloaded personnel. It may also reflect a conflict within a federal agency that is grappling with its transition from having purely farm assistance functions to having quasi-regulatory functions.

SCS Project Results and Case Studies

This section discusses patterns and practices of the Vermont SCS as they relate to cultural resources. First, broad trends are presented concerning which types of farm projects are most likely to endanger archeological sites. It was surprising to find that in Addison County, Vermont, water diversions and tile lines, and not manure pits and streambank stabilizations, are most likely to impact archeological sites. This pattern may be true throughout the Champlain Basin.

SCS information management and security are next discussed as long-term issues that will affect the implementation of cultural resource reforms in the agency. Lastly, ten case studies are presented to illustrate the range of ways in which SCS may affect and manage cultural resources. The great variety and complexity of case studies is also apparent. In some cases, the cultural resource issues were handled readily and successfully, while, in several case studies, there were difficulties and problems in resolving the issues. The case studies emphasize the potential for SCS to be an effective agent for cultural resource protection.

Patterns of SCS Earth-moving

Although well over 100 farms were visited during the project tenure, only 86 projects involved enough first-hand participation throughout planning and implementation to be included in this analysis. Simple descriptive analysis of the farm projects clearly shows a steady cumulative impact to cultural resources in Addison County. This impact may be described in two ways: (1) direct impact and (2) indirect or potential impact. In describing these trends, the terms "associated cultural resource" and "additional cultural resource" are used to distinguish between direct and indirect impacts. An associated resource is an archeological site lying either directly in a project impact area or adjacent to the project area, to the point of being impacted by movement of heavy equipment during implementation. In contrast, an additional resource is a site on a farm which will apparently not be affected by the project at hand, but which could easily be affected by future projects. The discovery of

associated resources may require some form of project redesign or extra specification, while additional resources usually do not require alteration of the project.

Ideally, archeological site protection involves not only recognition and avoidance of associated resources, but also awareness of additional resources that lie outside the current project area. After all, these other resources may be impacted by future farm projects. Eleven projects, or 12.9% of reviewed earth-moving projects, involved an associated archeological site (see Table 2.1). Most of these sites would have been damaged if the project study had not been underway. Even with the presence of a professional archeologist in the field office, two (2) projects damaged a site and one (1) project totally destroyed a site. An additional 28.2% of reviewed projects included an additional resource elsewhere on the farm. In some cases, these additional resources may become directly-affected associated resources following the study, as mandated LTA practices are implemented.

The potential cumulative impact to Addison County cultural resources by SCS pollution control projects on farms is significant. In a single field season (1992), the SCS had contact with about one-third, and was involved in earth-moving on almost one-fourth, of the county's farms. During that period, more than one-third (34.1%) of SCS project farms contained either an associated or additional cultural resource.

Cultural resources affected and potentially affected by SCS projects are widely distributed in the county. The eleven projects with associated sites were dispersed in five of the eight county watersheds (see Table 2.2). Additional cultural resources were located on farms in all eight watersheds. In this regard, the percentage of farms with cultural resources in each watershed is instructive. The lowest value is for the Lake Champlain Direct watershed, where 23.8% of the farms included a cultural resource. Oddly enough, the Lake Champlain shoreline area comprising this watershed is famous for its extremely high density and quality of cultural resources. The highest site percentage is in the Lemon Fair River watershed, where 64.3% of farms include an archeological site. Ironically, this watershed contains only a low percentage of the county's recorded archeological and historic sites. As discussed in Part 2 of this report, the Lemon Fair watershed is one area where archeological sites have probably been under-reported.

An examination of types of projects affecting cultural resources produced surprising results. The Archeology on the Farms Project was conceived because of the potential impact of pollution-control waste storage pits that were being built throughout the Lake Champlain Basin. However, not one of 30 waste pit sites examined during the project involved an

Table 2.1. Middlebury SCS Field Office -- Nov 1991-April 1993

projects with associated archaeological site	= 12.9%
projects with additional non-impact archaeological site(s)	= 28.2%
total project farms with archaeological site(s)	= 34.1%

Table 2.2. SCS projects and archaeological sites described by watershed.

Watershed	# Farm Projs	Assoc sites	Addit sites	previously unrecorded	farms w/sites
Dead/Otter	16	3	2	40.0%	25.0%
Middle Otter	8	0	2	0.0%	25.0%
Little Otter	13	2	7	33.3%	38.5%
Lemon Fair	14	4	9	46.2%	64.3%
Lewis Creek	4	0	2	100.0%	25.0%
Lake Champlain	21	1	11	75.0%	23.8%
Middlebury	2	0	1	0.0%	50.0%
New Haven	8	1	2	0.0%	25.0%
TOTALS	85*	11	36	59.4%	34.1%

* One farm project area straddles two watersheds.

associated cultural resource. Most waste pits are placed in previously disturbed or filled land near an existing barn, and, thus, are usually not threatening to cultural resources. (However, following the project, in June, 1993, a significant prehistoric site was encountered in a proposed waste storage pit project area. Thus, these projects cannot be categorically excluded from archeological field survey.)

The more common water diversion and tile line projects by far had the greatest potential to affect the most cultural resources. Eleven (11) projects, or 22.2% of the water diversions and tile lines, involved an associated cultural resource. These projects can have very large impact areas and may destroy entire archeological sites (for example, see Farm #22 case study). Streambank stabilization projects (ripraps) are also thought to be potentially harmful to cultural resources, but the eight riprap projects conducted in 1992 did not impact any archeological sites. However, most of those projects were conducted in the upper reaches of secondary watersheds. In the more sensitive lower reaches of watersheds, riprap projects remain a potential threat to cultural resources. For example, in another region of Vermont, an extremely significant site has recently been found in an SCS riprap project impact area.

A breakdown of archeological resources into "recorded" versus "previously unrecorded" is also instructive. Recorded sites are listed in the Vermont Archaeological Inventory and have files at the VDHP in Montpelier. In contrast, unrecorded sites have never been documented, are not contained in the VDHP files and must be recognized in the field. Many recorded sites contain little or no information beyond simple geographic location (and sometimes the location itself is dubiously recorded). This is because much information comes to VDHP from interested amateurs with variable skill levels who have cooperated in the accumulation of basic site data. Despite this, previously recorded site information may be obtained by SCS staff from simple site checks with VDHP. Thus, protection of previously recorded sites is a fundamentally different practice than recognition and protection of unrecorded sites.

As discussed in the last chapter, only a fraction of Addison County sites have been recorded, although some very significant sites are known. Project results show that both previously recorded and unrecorded sites are affected by Vermont SCS projects. The majority of sites (59.4%), however, were unrecorded prior to field recognition. These figures emphasize SCS's need to communicate with VDHP to deal with previously recorded sites, but also stress the importance of field recognition skills. Thus, archeological site protection is not merely a question of consulting an established inventory for locational information.

In contrast to archeological resources, consideration of historic structures during farm project implementation in Vermont can begin to be accomplished by referring to readily available, published inventories or unpublished but still available file data in Montpelier at the VDHP. The comprehensive lists of historic structures in Addison and Rutland Counties (Johnson 1989, 1992) have been published, and copies should be kept in the respective SCS field offices.

A few key observations may be made from the simple statistics presented above. First, except for historic structures, the wide distribution of the county's cultural resources renders difficult any plan to pinpoint only a few highly sensitive zones for focusing cultural resource protection. Second, it is obvious that past SCS earth-moving in Addison County has already impacted many sites and, without changing SCS pre-Archeology on the Farm Project procedures, will continue to do so. Third, SCS projects appear to be impacting the most cultural resources in areas where sites are under-reported. That is, from a scientific standpoint, the sites being damaged and destroyed are among the most little-known and poorly-understood in the county.

How does systemic, diligent and on-going cultural resource management affect an SCS field office's ability to function in their primary mission? The general image of archeologists has long been that their presence stops projects cold, or at least delays them for months or years. A study of the actions taken and results of cultural resource management in Addison County disputes this popular notion (see Table 2.3). A total of 71.6% of reviewed 1991-1992 projects (63 projects) proceeded on schedule as planned, and an additional 9.1% (8 projects) proceeded with only cautionary warning of a nearby cultural resource. Only four (4) projects were redesigned or had extra specifications added to protect a cultural resource, and only one (1) (Farm #62 case study) produced a significant delay. Only one (1) project was scrapped (Farm #17 case study), and this was caused by an unusually complex case involving a combination of the archeological site with other design problems. The project abandonment was approved by the farmer. In this case, cultural resource protection was begun late in the planning and implementation process. Among the early 1993 projects not included in these statistics, an additional four projects (4) required redesign prior to construction and a fifth case remains under study.

Overall, these statistics describe what archeologists and architectural historians have long known: that cultural resource management, conducted efficiently and early in the planning process, protects many sites that would otherwise have been damaged, and only delays or derails projects in extraordinary circumstances.

Table 2.3. Summary of 1992 SCS Earth-moving Projects, Addison County, Vermont.

- 1 -- project proceeds as planned
- 2 -- project proceeds as planned, with cautionary warning of nearby cultural resource
- 3 -- project proceeds but redesigned or extra specifications added
- 4 -- project scrapped due to cultural resource and other design problems
- 5 -- project already underway when examined or cancelled by farmer for reasons unrelated to cultural resources
- 6 -- cultural resource damaged or destroyed
- NA - project did not involve earth-moving; cultural resource reported

Action/Result	Frequency	Percent
1	63	71.6%
2	8	9.1%
5	8	9.1%
6	3	3.4%
3	2	2.3%
NA	2	2.3%
4	1	1.1%

Perceptions of Cultural Resources

Perceptions of and receptivity to new ideas and changes in established work routines is a complex anthropological topic. Social scientists have attempted to statistically measure perceptions through in-depth interviews and questionnaires. In this case, a series of impressions, anecdotes and random observations illustrate Vermont SCS's commitment to revise and improve cultural resource management practices, as well as the level of public support present in the region for cultural resource protection.

SCS Perceptions of Cultural Resources

During the project tenure, Vermont SCS increasingly recognized the presence of a serious cultural resource issue. At both the levels of state office and local field office, consistent efforts have been made to address cultural resource issues and to devise innovative problem solutions (for example, see Farm #62 case study). Despite this, the range and scope of potential solutions are constrained by the current lack of direction in the General Manual.

In general, the agency from top to bottom is undergoing a trend towards increased regulatory functions. Food Security Act (FSA) spot checks of individual farm plans and practices, along with wetlands and highly erodible land regulations, exact enormous amounts of time and effort from field personnel. The Middlebury Field Office has become overloaded with regulatory paperwork to the point that any extra activity is unwelcome, regardless of its merits. The heavy workload does not allow the time investment necessary to fully deal with the social responsibilities that are legally attached to federal funds and technical assistance. This is a key point because SCS nationally has long maintained that cultural resource legal responsibilities could be mainly handled internally with minimal involvement of professional archeologists. The ability of field personnel to cover these duties is thus constrained by (1) the skill level that can be achieved in the absence of the long-term presence of professional archeologists, and (2) the availability of enough time to correctly perform cultural resource duties and maintain proper records. The reluctance to embrace cultural resource protection in SCS (at the field office level) was clearly a result of increased work pressures on SCS field personnel, combined with vague notions that archeologists wish to stop all earth-moving projects.

The Archeology on the Farms Project has been instrumental in changing basic perceptions at the State Office and Middlebury Field Office. First, the project demonstrated that projects

proceed; second, it allowed SCS personnel to see tangible benefits of site protection; and, third, it showed SCS staff how painless cultural resource protection is when it occurs early in the planning process. The State Office has also been able to observe the subtleties and complexities of cultural resource protection, and to appreciate the specialized skills that are necessary to perform these functions. Despite this progress, other Vermont field offices continue to express reluctance about systematic cultural resource protection due to fears about increases in workload, changes in routine, and, perhaps, continued misperceptions about archeology.

As a result of this project, an already active, productive and on-going dialogue has increased among the State Resource Conservationist, the SCS Cultural Resources Coordinator, and the VDHP, particularly the State Archaeologist. The statements contained in this report, as well as the recommendations presented in Chapter 4, have been discussed at length with the SCS. There are specific agreements and disagreements among SCS and VDHP but there is fundamental agreement that problems exist in adequately addressing cultural resources. This project provided an opportunity to study patterns of SCS projects, and to learn more about specific cultural resource needs. Dialogue has most recently turned to address methods for constructively dealing with the issues. Most importantly, Vermont SCS agreed in principle that cultural resource management in the agency requires the presence of at least one centrally located professional archeologist to assist the state and field offices. In May, 1994, a full-time archaeologist was hired to oversee Vermont SCS cultural resource protection efforts.

Farmer Perceptions of Cultural Resources

Interactions with farmers were encouraging, with many farmers expressing an interest in archeology. Most farmers feel they are land and resource stewards. Some keep small artifact collections from their fields, and a handful are avid artifact hunters. Addison County farmers have property rights concerns, and first want to be assured that a professional archeologist is not there to take land away or out of production. Farmers' fears have unfortunately been heightened by changing wetlands regulations which have taken some land parcels out of production.

During the project, farmers were approached by explaining the exact nature of cultural resource protection and the fact that legal mandates only cover federally funded and technically-assisted projects. Site protection was presented as a voluntary stewardship practice. In the case of associated cultural resources on SCS projects, every effort was made to avoid the site or otherwise redesign the project. Farmers were made aware of the VDHP's policy that farmers should not bear

financial responsibility if project redesign produces a higher project cost (but see the Farm #86 case study).

Farmer perceptions toward cultural resource management and protection are closely linked with how the subject is presented by SCS field personnel. If field personnel present the protection effort as an SCS policy and practice, then farmers in Addison County usually respond well. If, on the other hand, SCS personnel present cultural resource protection as an "extra" or external temporary project, farmers are more likely to respond poorly. For cultural resource protection to function within SCS, site and historic building protection must be considered an integral part of SCS resource conservation, instead of an additional headache.

Perceptions of Other Addison County Citizens

The project's work with various citizen and student groups throughout Addison County is discussed in detail in Chapter 4. Prior to that discussion, it is worthwhile to note the strongly favorable attitude of Addison County citizens to cultural resource protection. When speaking with citizens, emphasis was placed on cultural resources as a record of Vermont's heritage (in the case of prehistoric sites, the only record). This record is very poorly understood, and the sites must be documented and protected before any meaningful research program can begin.

Knowledge of the past was presented as a broad public benefit. Through the efforts of VDHP, many county residents were already aware of some cultural resource issues and the values of cultural heritage protection. That impact is minor, however, compared with the impact of a sustained presence of a professional archeologist in the community. Hopefully, the public education and outreach activities described in Chapter 4 will detail that impact. Positive public response to the Archeology on the Farms Project appears to have crossed the various political, economic and social sectors of the county.

Information Management and Security

Information management and security is an important issue that became prominent late in the project period. Vermont SCS keeps detailed farm records, particularly for farms with LTA contracts, or farms receiving federal benefits. These records include cropping history for individual fields, recommended crop rotations, records of highly erodible fields and wetlands, and history of drainage and other construction projects. Individual farm folders also contain responses to a baseline survey of how many animals and cropped acres, etc., are present. One type of information that is not contained in farm folders is location of

cultural resources, including archeological sites. While historic buildings information is public and should be contained in farm folders, locational information on archeological sites is sensitive because of the widespread practice of collecting and destroying sites through digging.

The Vermont field offices have, in their baseline data, responses to questions of whether or not farmers have found artifacts (such as "arrowheads") on their land, and whether they have old foundations or cellar holes. This information was collected in the past at the suggestion of VDHP, with the idea that it might alert SCS field personnel to farms containing cultural resources. Even this cursory information places archeological sites at risk of destruction. In the case of the Middlebury Field Office, files are worked on by volunteers and employees of a state subsidized retraining program. In one instance, a worker specifically noted the presence of archeological data in the baseline surveys, and stated his intention to make a list of farmers with sites so he could contact them and collect artifacts. This concern was raised to me by SCS field personnel, as that statement was made in my absence. I, in turn, raised objections about the person's presence in the office with file access. It is of course the responsibility of SCS to regulate and control access to their file information. Because field offices frequently have interns and volunteers working in project files, it is important that direction and procedures be developed to handle these situations.

More importantly, SCS has sought greater access to specific site information data in its efforts to develop a self-sufficient cultural resource protection system. At one point, I planned to "red-tag" folders of farms with important cultural resources to alert fieldworkers and to prevent unintentional site destruction. The plan was abandoned as a result of the above incident. As new agreements on cultural resource issues are developed on a state-by-state basis, many SCS offices across the nation may gain access to specific locational archeological site data. Again, this emphasizes the need for various protocols for safeguarding site location data in field and state offices. The legal issue of the confidentiality of archeological site locations is germane to future discussions on the topic. Vermont, like many other states, has passed a law that exempts archeological site locations from public disclosure to protect sites from looting and vandalism (see Title 22 of Vermont Statutes Annotated, section 761[b]; and Title 1 section 316[20])

SELECTED CASE STUDIES

Overview

The following eleven case studies illustrate the variety and complexity of archeological resource issues that may arise as SCS projects are planned and implemented. Case studies were chosen to illustrate issues that may appear during both planning and implementation. An attempt is made to fairly describe a range of case studies, from very successful to difficult. The case studies involve several different types of archeological resources, both prehistoric and historic. Cases are presented where archeological resources were directly threatened, and where archeological resources not immediately threatened may nonetheless be managed and protected within the framework of SCS responsibilities and programs. A distinction is made between case studies that occurred relatively early versus later in the project period. In this way, it is hoped that a progression may be seen in the ways one Field Office learned to recognize and handle archeological resources in the field under the professional supervision of an archeologist.

Early case studies

Farm #2 (March 1992)@@

This farm is a simple case study. The farm was one of the first I visited in the field with SCS personnel. The farm contains recorded prehistoric sites and the farmer keeps a small artifact collection from his fields. A series of diversion ditches were routinely planned through a large recorded prehistoric lithic scatter (sites VT-AD 289, 511 and 512 in the Vermont Archaeological Site Inventory). Diagnostic artifacts of the Woodland Period (from 3000 years ago to first European contact) were recovered, which made the site interesting because most sites in the immediate area have been attributed to earlier Archaic periods (Archaic ranges in age from 9000 to 3000 years ago). The scatter covers three high knolls, crossing both plowed and unplowed areas. This site may be eligible for inclusion in the National Register of Historic Places.

The SCS surveyor felt that because the diversions were following a low area between knolls, it would not affect the site. In this case, site boundaries were intuitively gauged by a non-archeologist. Despite my repeated statements, I was unable to get the diversion paths changed. At that time, SCS personnel felt pressure concerning quick project implementation on this farm. Still, these diversions have not been excavated, but remained in the planning stage as the project ended. No successful solution to this situation was attained at the conclusion of this project, partly because of the farmer's lack

of interest in completing his Long-Term Agreement.

This simple case illustrates some difficulties encountered early in the project. The Middlebury Field Office was inexperienced in dealing with cultural resources, and I had no authority to recommend alteration of a field routine. I also had not learned about the rapidity of field design and layout, and did not expect the project to be immediately designed and flagged in a single visit, as indeed it was. Archeology was essentially viewed as a novel and interesting project, but one that would be quietly unintrusive to "nuts and bolts" daily fieldwork. My immediate request for a project change may have been viewed as rude and overly authoritarian for a newcomer. My inexperience with SCS project types and impacts left me unable to gauge the potential damage to the site, particularly because the Archeology on the Farms Project was designed with manure pits and not diversions in mind.

Farm #17 (May-July 1992)

I arrived at this farm during the first phase of a complex SCS project including (1) hedgerow removal, and (2) diversions. The project was designed to change the field to contour plowing and to drain persistent wet areas. Much of the removal of large tree stumps had already occurred by the time I arrived. A cross slope diversion was flagged in place. My field inspection revealed an unrecorded prehistoric lithic scatter in the plowed field. The site was designated VT-AD-693 in the Vermont Archaeological Inventory. The site had already been damaged by hedgerow removal, and the diversion was planned to pass directly through its center. Diagnostic artifacts of the Late Archaic period (6000 - 2900 years ago) were recovered. The presence of ground stone tools and the high density of artifacts suggested a residential site. The surface artifact scatter exhibited well-defined edges, implying a small homestead. Perhaps most interesting, the site is located on a sloping field far from water, in an area that defies any archeological sensitivity models designed to locate prehistoric sites.

The case study is complicated because hedgerow removal to control soil erosion results in site disturbance but will provide long-term site protection. Ideally, archeological data recovery should have preceded the hedgerow removal, and the presence or absence of sub-plowzone deposits could have been determined. In this case, there was no possible alternate path for the diversion that could spare the site. In addition, there were doubts on the part of SCS technicians as to whether the diversion, once excavated, would flow correctly. As a combined result of the site and the technical doubts, the diversion was scrapped. The action was approved by the farmer. This site has been subsequently used as a training area for SCS field personnel to teach recognition of lithic scatters in plowed fields.

Throughout the process, the farmer was interested and cooperative, and led me to document additional prehistoric sites on his land. In this case, the site was protected following the initial damage caused by hedgerow removal. However, because of technical problems with the planned diversion, the relative importance of the site to the final project decision was never tested. That is, the protection of the site occurred as much as a result of technical problems with the diversion as the merits of the archeological site. Thus, an unanswered question is, at that early project planning stage, how would events have unfolded if the SCS project had not developed technical problems?

Farm #22 (May-October 1992)@@

This project took place on a "gentleman's farm," or a farm where the owner has large out-of-state income and operates the farm without the pressures to survive and produce profit. This is important to understand, because SCS projects on this farm involve only technical assistance and not funds. At times during the project, SCS personnel made attempts to separate "federally funded projects" from "technically-assisted projects" for purposes of cultural resource protection. In reality, there are no legal separations based on funding versus technical assistance, although SCS appears to deal more with this distinction than other federal agencies. I was in the field with an SCS technician who surveyed and flagged a diversion through an unrecorded prehistoric lithic scatter, designated VT-AD-694. Prior to evaluating a site, established procedure is to attempt to redesign the project to avoid the site. I consulted with the technician, discussing width of the diversion ditch, path of heavy equipment, and direction where the spoil would be spread. The ditch was relocated about 20 meters to the west of its originally planned location, presumably avoiding the site.

On hearing about the discovery of a prehistoric site, the farmer's wife called me to express her interest, and to ask me to survey other areas of the farm for sites. I told her that we had avoided the site that lay in the area of the proposed diversion and made an appointment to visit the location together. During our visit to the site a few days later, I discovered that it had been completely destroyed during construction.

Site destruction occurred because of the same combined pattern of field personnel resistance to design change and the archeologist's inexperience with SCS earth-moving patterns that occurred at Farm #2. First, I was not assertive enough in my requests to substantially redesign the project. Second, I had no idea about the true impact area, especially the significant width, of diversion ditch excavation. Third, the contractor was not involved in the process of project redesign and site avoidance. I was hesitant to flag site boundaries in the field because of a past bad experience with that technique. However,

temporary field flagging was later used in selective situations to help contractors avoid archeological sites during construction, and generally, this is a useful protection tool. I subsequently learned that the contractor who accidentally destroyed the site was, in fact, sensitive to cultural resource issues and interested in working to protect them. The same contractor skillfully avoided a flagged archeological resource during construction on Farm #47.

In one of the most illuminating conversations of the project, SCS personnel stated that they did not understand why I was upset. The site was still there; it had just been placed in a new location and buried. The conversation served to remind me how professional archeologists take the concepts of site integrity, context and association so much for granted that we forget that untrained individuals do not understand them. This conversation also underscored the need for intensive training on archeological resources for SCS staff. Subsequently, two more prehistoric sites (VT-AD-697 and VT-AD-698) were found on land owned by the same gentleman farmer. These sites were located during survey conducted at the farmer's request that was not connected with SCS work. The additional sites were recorded only because the project had spurred the farmer's general interest in archeology.

Later case studies

The later case studies presented reflect some of the lessons learned from the early case studies. They hopefully also display a more sophisticated manner of dealing with cultural resources from both the SCS and my personal standpoints. As the project continued, cultural resource case studies came to have greater input from Middlebury's District Conservationist and the State Office. These farms were also approached specifically as case studies (instead of impediments to SCS work) that could illustrate why and how SCS projects threaten cultural resources, or why cultural resources may go undetected by SCS personnel. As a result of this willingness to compile case studies, much better attempts were made to devise innovative solutions and, in at least one field office, to systematize and regularize cultural resource protection practices.

Farm #62 (May-October 1992)

Introduction

The Farm #62 case study is discussed in great detail, compared to the other case studies, for several reasons. This case illustrates the complexity of site evaluation, and the level of field and archival research that may be required to properly understand a site. The case also reveals the amount of

information which may be learned during the course of managing a cultural resource. Furthermore, this case study highlights the occasional need for SCS to hire a specialist (in this case, an historical archeologist) whose sole purpose is to help evaluate a site and provide the needed context to successfully move the farm project forward.

Background to the Project

Farm #62 is one of the largest dairy farm operations in Addison County. Many farm improvements have been undertaken in cooperation with SCS and the Agricultural Stabilization and Conservation Service (ASCS). In one field, water bubbling from underground produced a muddy field with little farming value. The muddy area became a financial liability when a heifer drowned near the water source. Not much attention was paid to a cut limestone foundation located next to the bubbling water.

My initial reaction to the project area was one of caution. Nineteenth century limestone foundations are common throughout Addison County, and archival research is necessary to evaluate them and winnow out the significant sites. On first viewing, the foundation was unimpressive and in rather poor condition. Small trees had grown inside the foundation and were uprooting its stones (Figure 2.1). Pastured Holstein cows were attracted to the water and tree shade, and had heavily trampled the site area. Mud and manure had filled the foundation and created a swampy mess. The sole curiosity was that the building had been constructed so close to an apparent spring.

After conducting preliminary archival investigations, the significance of the site became clear. The Bissell family had developed Stony Spring Farm during the early 19th century, and it became one of the largest Merino sheep farms in Vermont. Archival records were abundant, but none involved the architecture or technologies of the farm. E.N. Bissell was a late 19th century state legislator and long-time president of the Vermont, New York and Ohio Sheep Breeding Association. Also, a few general agricultural documents suggested that the building was used as a sheep pen and wash. The available archives suggested that the site was significant, and a historical archeologist from Rutland, Sheila Charles, was brought in to independently evaluate the site. She concluded that the site was clearly eligible for the State and National Registers of Historic Places, based on its special character, apparent rarity and its connection to a person and industry of local and state importance. The evaluation of significance was also based on the paucity of information available on material aspects of the Merino sheep industry.

The remainder of this case study is one of negotiation and compromise among all parties involved, particularly among the

Figure 2.1. General views of the foundation at site VT-AD-706, August 1992 (above) and December 1992, after tree cutting (below).



farmer, SCS, and the VDHP. Of primary importance was balancing everyone's objectives, including the farmer's goal of drying and eventually cropping the field, the archeologists' goals of protecting the site and gathering preliminary information about it, and the SCS's goal of implementing an integrated farm conservation plan. This site has been designated VT-AD-706 in the Vermont Archaeological Inventory, with detailed site documentation and research data on file in Montpelier at the VDHP.

Site features

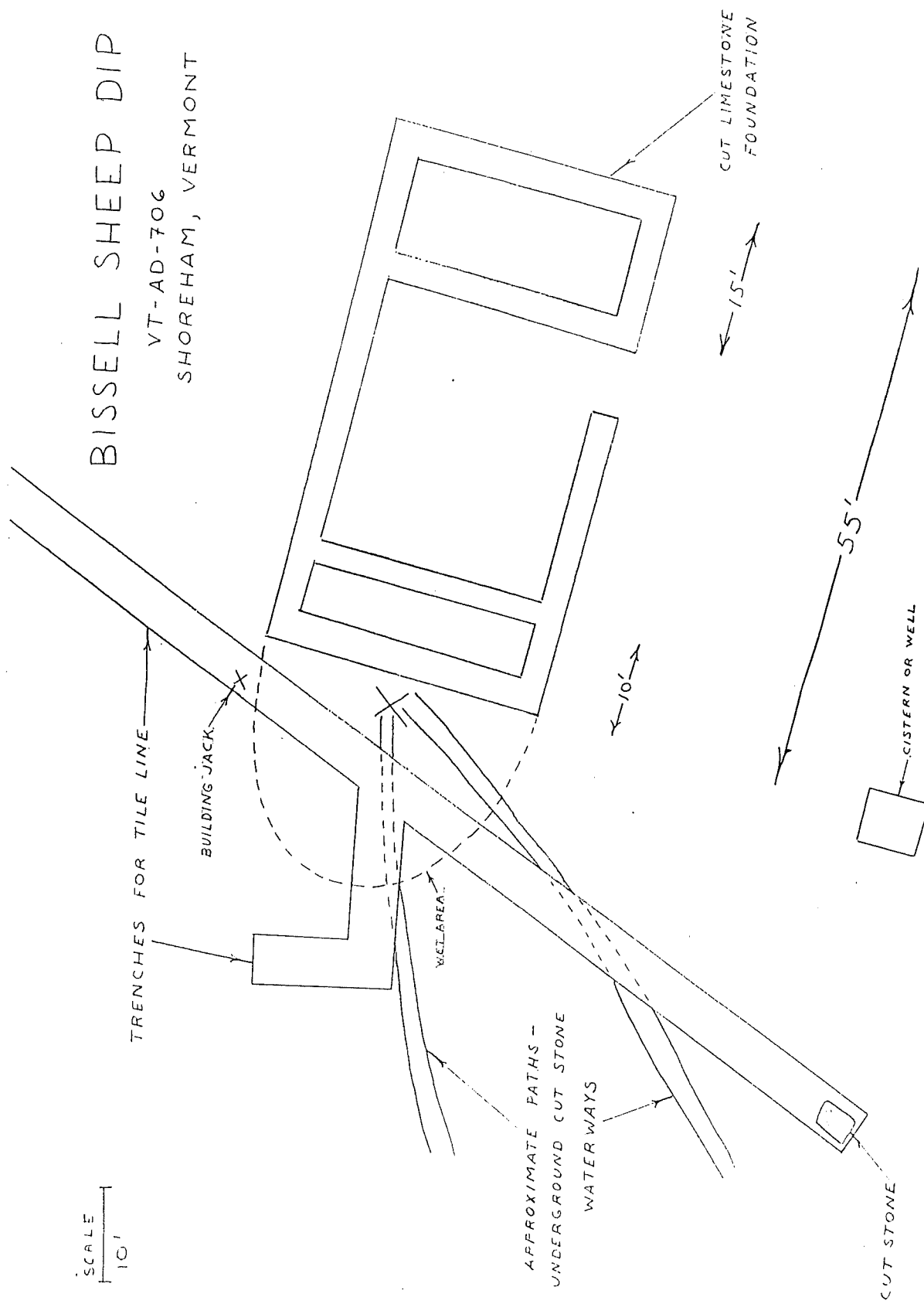
The Bissell Sheep Structure consists of a cut limestone foundation, a series of underground waterways and midden deposits with artifacts (Figure 2.2). The cut limestone foundation measures 55' by 30' and primarily consists of three courses of flat, tabular limestone slabs. Larger limestone blocks are present in all interior and exterior corners. The foundation includes three rooms, including a long, narrow westernmost room (interior 24' by 5'), a larger central room (interior 27.5' by 24') and a third, easternmost room (interior 24' by 10'). An entranceway with cornerstones is present on the south wall of the large central room, but the two smaller flanking rooms display no obvious entrances. The foundation was laid out and constructed to the exact specifications (within one inch) listed above. Just west of the foundation was a wet area where water bubbled to the surface. South of the foundation, a square well or cistern was also noted. Scattered agricultural and architectural artifacts of metal and glass were present on the ground surface outside the foundation on all but the west (wet) side (see "Materials Recovered" section).

As will be further discussed below, at least two underground stone and rubble-lined waterways were recorded during project construction. These waterways consist of a combination of finely cut rectangular stones with smaller, irregularly-shaped and partially-cut stones. East and downslope of the foundation, construction in previous years had unearthed a wooden pumplog, according to the farmer. This raised the question of whether underground features built for water movement or drainage were associated with the structure. We also began to question if the bubbling water at the western edge of the foundation resulted from a spring or an underground waterway system.

Archival research

Preliminary archival research was conducted at the Sheldon Museum, Ilsley Library, and Middlebury College, all in Middlebury, Vermont. Once it was learned that Farm #62 had been a 19th century Merino sheep operation, the archival search included three aspects: (1) general documents on the Merino sheep industry; (2) documents on the history of Addison County Merino

Figure 2.2. Plan of site VT-AD-706.



N

breeding; and (3) specific documents relating to this particular farm and foundation.

A few handbooks on Merino sheep breeding are available, one of which is Henry Randall's *The Practical Shepherd: A Complete Treatise on the Breeding, Management and Diseases of Sheep*, published in 1863. Most interesting is Randall's description of sheep washing. According to Randall, a sheep wash was constructed by..."Damming up a small stream, conducting its water a few feet in a race, and having it fall thence a couple of feet into a tub or washing vat. The vat was a strong box, large and narrow enough to hold four sheep at a time. It was from 3 1/2 to 4 feet deep, about 2 1/2 feet of it rising above the surrounding platform for the washers, and the remaining portion being sunk in the ground. The sheep were penned close at hand (Randall 1863:163)."

Sheep washing was important to the mid-19th century Merino industry, because the breed produced a heavy yellow yolk, or lanoline oil, in its wool. Sheep washing produced a desirable, very white wool (Bard 1811:12). It is the proximity to active water, the narrow dimensions required for a washing chamber, and the need for a larger nearby enclosure that suggested the limestone foundation was related to sheep washing. An article in the *Vermont Stock Journal* of 1858 similarly describes the practice, emphasizing the importance of using soap, letting the wet sheep stand before rinsing, and sheltering the sheep (*Vermont Stock Journal* 1858:93). The last recommendation is noteworthy because it indicates that sheep dips could be more substantial structures in the northern U.S. than the simple outdoor waterfalls that Randall's description suggests.

The local history of the Addison County Merino industry is available in at least three forms. Sporadic references to the industry are made in the *History of Addison County* (Smith 1886) and the introduction to *The Historic Architecture of Addison County* (Gilbertson 1992), and a specific history was written by Betty Jane Belanus (1977). These narratives describe an industry with many booms and busts through the 19th and early 20th centuries. The opening of the Champlain Canal in 1823 "cut...in half the costs and time to transport goods to and from markets in the south...Sheep farmers particularly benefited from the opening of the canal" (Gilbertson 1992:8-9). Favorable tariffs produced local boom periods of varying intensity in 1824, 1828, 1846 and 1867, while epidemics, unfavorable tariffs or economic panics produced crashes in 1837, 1842, 1857 and 1873. In 1840, the U.S. Census listed Addison County as America's premier sheep raising county. That year, Addison County had the highest U.S. density of sheep (373 per square mile) and a ratio of 11 sheep for each person (Belanus 1977:13). The Civil War was also a boom period for Vermont Merinos, as hostilities cut off southern cotton supplies, raising demand and prices (Belanus

1977:22). Many of Addison County's finer examples of Greek Revival and Gothic Revival architecture stand as testimony to the industry's mid-19th century power and wealth (Johnson 1992).

There is much disagreement concerning the decline of the industry and its demise after World War I. Various factors discussed include the rise of the more profitable dairy industry, rising demand for more versatile mutton/wool sheep (the Merinos were primarily wool sheep), declining wool markets, competition from the western U.S. and abroad (ironically spawned by sheep exported from Vermont), stress placed on relatively small land plots by large sheep herds, and unfavorable political tariffs of the Cleveland and McKinley administrations just before the turn of the century. Whatever the causes, an industry which produced tremendous wealth at its height proved to be unsustainable, and its final collapse was complete and dramatic. The last Merino sheep left Addison County in 1949 (Belanus 1977:42-43).

Several documents concerning this farm and site VT-AD-706 were located, including thoroughbred catalogues listing the farm's sheep pedigrees (Figures 2.3 and 2.4). For example, the Vermont Merino Sheep Breeders' Association (1879, 1887) published two registers. According to these registers, this farm was named Stony Spring Farm and was owned by E.N. Bissell. In 1879, the farm had 127 rams and 223 ewes for a total of 350 sheep, making it one of the largest sheep farms in Vermont (Vermont Merino Sheep Breeders' Association 1879:174). By 1887, however, the number of Bissell's sheep had declined to 140, including 67 rams and 73 ewes (Vermont Merino Sheep Breeders' Association 1887:17).

The most important single document is a booklet published by this farm itself around 1918 entitled, "Stony Spring Farm Merinos: Birthplace and Life Long Residence of E.N. Bissell, East Shoreham, Vermont, Breeder and Exporter of Spanish and American Merinos" (Anonymous, ca. 1918) (Figure 2.5). The ten page booklet appears to have been an attempt through publicity to save the sheep enterprise in the wake of Mr. Bissell's death and the industry's rapid decline (Figures 2.5 and 2.6). The booklet contains a biography of Bissell, including his stints as state legislator (1882); president of the Vermont Breeders' Sheep Shearing Association (1880-1881, 1886-1891); president of the Addison County Agricultural Society (two unspecified years); president of the Vermont, New York and Ohio Sheep Breeding Association (seven unspecified years); member of the State Board of Agriculture; and finally, in the last year of his life, an officer in the National Wool Growers' Association. According to the booklet, the Bissell sheep herd was established in 1848 by S.L. Bissell; his son E.N. Bissell (1840-1917) began actively breeding sheep when he was 16 years old (Figure 2.6). The son was later instrumental, according to this "in-house" pamphlet, in developing a "long staple 'B type' sheep from what had formerly been a short-stapled, greasy breed.

Figure 2.3. Shipping catalog of Bissell Merino sheep (1890).

SPANISH OR AMERICAN
MERINO RAMS and EWES

RECORDED IN THE REGISTER OF THE VERMONT
MERINO SHEEP BREEDERS' ASSOCIATION
EXCEPT TWO RECORDED IN THE
MICHIGAN REGISTER AND
DESIGNATED BY LET-
TERS M. R.

394
WILLIAM SHELDON
E. N. BISSELL & SONS
EAST SHOREHAM, VT.,
U. S. A.

636.3
4B

CONSIGNEE:
PITT, SON & BADGERY,
GEORGE ST., SYDNEY,
NEW SOUTH WALES, AUSTRALIA.

SHIPPED
FROM THE PORT OF NEW YORK,
APRIL 9, 1890.

Figure 2.4. Shipping catalog of Bissell Merino sheep (1897).

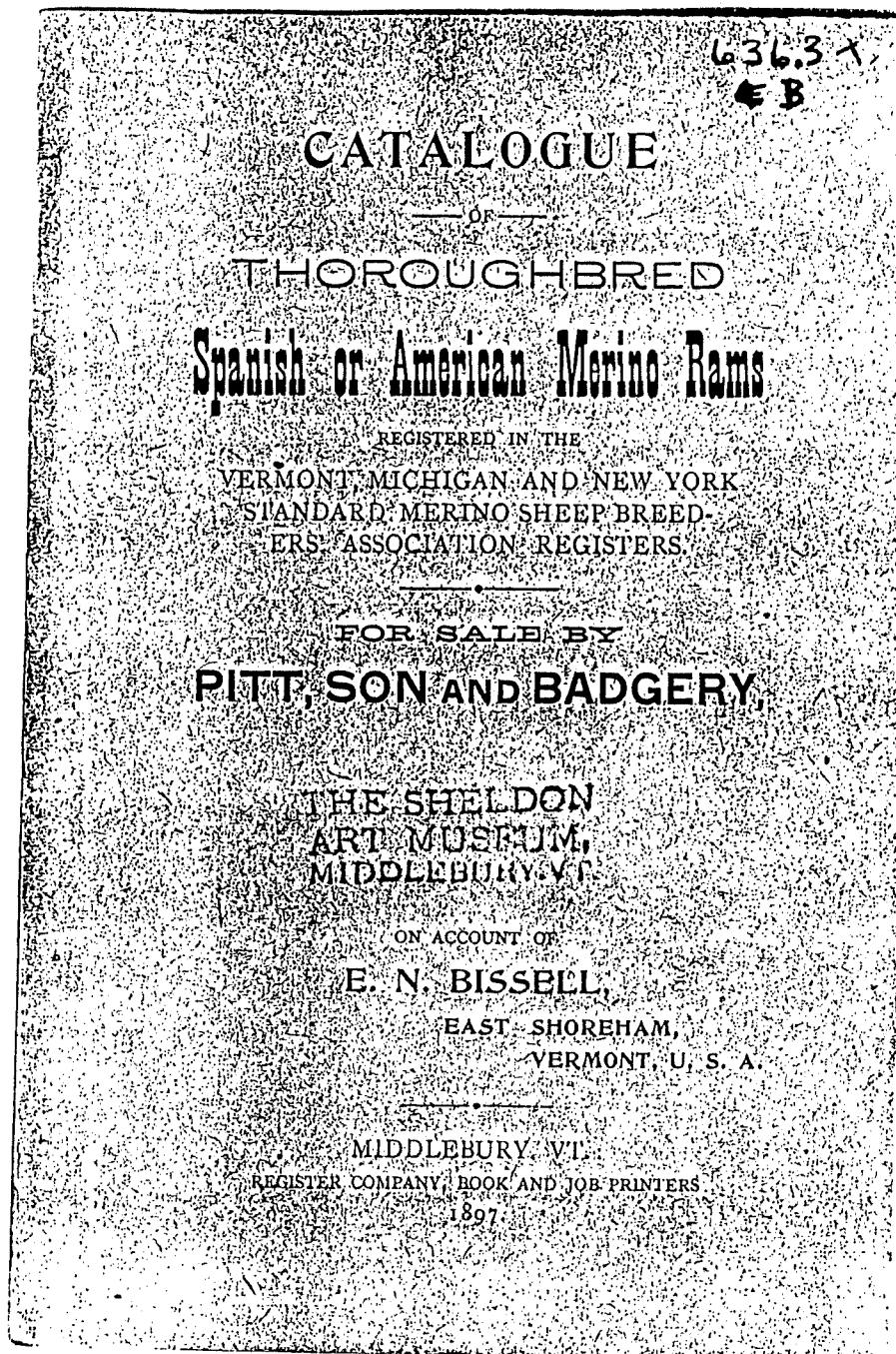


Figure 2.5. Cover of in-house promotional pamphlet on E.N. Bissell farm (ca. 1918).

STONY SPRING FARM MERINOS



BIRTHPLACE AND LIFE LONG RESIDENCE
OF

E. N. BISSELL

East Shoreham
Vermont

Breeder and Exporter of
Spanish and American Merinos

Figure 2.6. Portrait of E.N. Bissell (1840-1917).



E. N. BISSELL

The selective evolution of Merino sheep again becomes important when the sheep wash is discussed below. The booklet features noted stock rams that won championships and were sold for large prices. Specific rams from the farm were sent to South Africa, South America and Australia, as indicated in Figure 2.3. Perhaps the most telling portion of this pamphlet is its final paragraph: "It is the purpose of the Bissell heirs to continue the Merino sheep industry in the Bissell name under the management of H.E. Bissell, Administrator, and R.M. Osborn, Manager, who will endeavor to imitate and maintain the standard of honesty and square dealing set by their father, and will welcome old friends and new at Stony Spring Farm, in the beautiful valley of Lake Champlain (Anonymous, ca.1918:10)."

For the specific foundation under study, the documents suggest that large numbers of sheep were present on the farm in certain years (350 in the year 1879), although that number fluctuated greatly. The small size of the building under investigation, with its internal segmentation into small rooms, suggests that the building was not used exclusively or primarily as a barn. Unfortunately, other abandoned foundations have been removed from the farm, so it is not possible to determine if other similar structures were present. Sheep barn plans in Randall (1853) and standing sheep barns throughout Addison County are larger structures without internal segmentation. In summary, it must be emphasized that only a preliminary archival search was undertaken for this historic archeological site. Many more archives, including agricultural censuses and the records of local mills, undoubtedly contain more information pertaining to the Bissell family.

The preliminary search was sufficient to reveal an archive rich in the economics and commerce of the Merino industry but poor on other aspects such as technologies and non-domestic architecture. Site VT-AD-706 was found to be related to a regional and national leader of the Merino sheep industry. The site appears to represent a vanished form of architecture and water management associated with an industry and historical era that are poorly understood. With the archival evidence, the site's eligibility for inclusion in the State and National Registers of Historic Places was confirmed. Despite the presence of substantial archives, most documents relate to the 1880s or later, or after both the heyday of the Vermont Merino industry and the foundation under investigation. The documents give an interesting vision of an industry in decline. To investigate the industry at its 1840s and 1850s height, historic archeological research must play a more important role.

Negotiation and compromise

The proposed project would have disturbed the site. Ultimately, as the project dried the field and allowed the farmer

to plant corn, it would have resulted in complete site destruction. Negotiations concerning the future of the site and the farmer's field required extensive interpretation and discussion of the SCS's legal obligations and the farmer's personal property rights. From the SCS perspective, the project involved a non-cost-shared tile line designed both to drain a wet field and to stop water from seeping downhill into a bunker silo, causing spoilage of silage and contaminating a small stream. From this perspective, the farmer's activities following project completion were irrelevant. In contrast, the view of VDHP was that the tile line project was specifically designed to destroy a significant historic site. Indeed, the farmer openly voiced his desire to remove the foundation so he could crop the field.

Vermont SCS found itself engaged in an inevitable cultural resources dilemma it had not previously encountered. A second issue involved the scope of enforcement when cultural resources are involved in a federally-assisted project. As examples, because of the 1980 and 1990 Farm Bills, farmers are not allowed to drain new wetlands or overcrop highly erodible fields if they are receiving government benefits. A violation of these rule anywhere on a farm may lead to suspension of benefits to all land owned or operated by the farmer and a call-in of government loans. However, there is no backing legislation or similar policy on cultural resources, which involve similar responsibilities when government benefits or technical assistance are involved.

Should a cultural resource violation on a farm similarly endanger all federal benefits? Is the "unit of analysis" the farm, as in wetlands, or merely the "project area"? This is a significant unanswered question that will help determine the effectiveness of cultural resource protection in the SCS. If the farm is the "unit of analysis", then strong incentives will exist for protecting cultural resources by both the farmer and the SCS. On the other hand, if the individual project is the "unit of analysis", as it now seems to be, cultural resources will be "legally" destroyed through loopholes, such as the previously mentioned separation of the immediate project from its direct consequences.

On Farm #62, these issues came to the forefront for several reasons. First, there were other ongoing SCS projects in the design and construction phases elsewhere on the farm. Second, there are large previous financial obligations to Farmers Home Administration (FmHA) that fundamentally supported the farm's expansion and are regulated by the Food Security Act. The issues of persuasion and leverage to protect significant cultural resources, and the balances between government regulation, social responsibility attached to government funds, and private property rights were never more clearly drawn.

Many details were discussed. Could the site be fenced off, and could that fencing be cost-shared by the government? Could the site be protected in perpetuity through easement, or for the length of present land ownership? What were the consequences down the road if the site was destroyed? What constitutes an acceptable level of protection for the site? What if the farmer walks away from this tile line project, and destroys the site "on his own"?

In this case, a compromise produced a short-term solution that did not address the murkier long-term issues. VDHP dropped its request for fencing and long-term protection. The farmer made a written commitment to protect the site for the seven-year duration of his LTA with SCS. The SCS contributed cost-share money for the tile line that had not previously been available. The terms of the project agreement are listed below in full since they may stimulate further discussion.

1. Tile line will be placed at the site and cost-shared by SCS. Work will be monitored by the project archeologist.
2. Trees inside the foundation will be cut at ground level (not uprooted). This will also be monitored by the project archeologist.
3. Protection of the site will become a term of Farm #62's LTA, which lasts for seven years (until 1999). Farming practices, such as cropping, must be conducted around the site perimeter.
4. The site will be formally designated for inclusion on the State Register of Historic Places. A sign will be placed at the site to designate it as such.
5. Fencing of the site that was originally proposed is dropped from the agreement.
6. Any violation of this agreement must be reported immediately to the State Archaeologist (Giovanna Peebles) at the Vermont Division for Historic Preservation, Montpelier. Attempts to resolve the problem wholly revolved around the issue of site protection, both short-term and long-term. There was no discussion about the formalities of Section 106 and 36 CFR 800 compliance. For example, there was no formal written consultation between the SCS and the VDHP about the site's National Register eligibility; SCS did not solicit a formal "comment" letter from the VDHP; there was no consultation with the National Advisory Council on Historic Preservation; and there were no controlled, scientific excavations (or "data recovery") by a professional archeologist in the area to be impacted by tile line construction.

In this case, funds were not available and the SCS had no

system in-place in terms of policy, funding, personnel and equipment to respond to the necessary data recovery and no experience to contend with the formalities of Section 106 compliance. Ultimately, resolution about the immediate problem was reached in concurrence with VDHP. Monitoring by the project archeologist became the viable alternative to data recovery. Fortunately, a concurrent water quality issue protected this archeological site. However, without this water quality benefit, the site might not have been protected since there is no clear authority in the General Manual to cost-share projects that protect cultural resources. Since cultural resources are regularly encountered and affected by SCS projects, it is crucial that their potential protection by cost-shared projects be legitimized in the General Manual.

Project implementation

Project construction was conducted on December 21 and 22, 1992 (Figure 2.7). A local contractor conducted the work, assisted by employees of Farm #62. On the first day, a series of test pits was opened with an excavator along the proposed tile line corridor. Northwest of the foundation, pit profiles displayed undisturbed soil stratigraphy, consisting of a dark brown six-inch plowzone of topsoil heavily mixed with manure, and an abrupt transition to a uniform yellow clay to depths of four to five feet (at the bottom of pits). These pits provided control profiles of the natural stratigraphy.

In sharp contrast, the test pits excavated west and southwest of the foundation displayed heavily disturbed and darkened stratigraphy to a depth of four to five feet (Figure 2.8). The area southwest of the foundation showed the heaviest lensing and mixing of dark soils, and in this area a cut stone block (top surface 36" by 30") was uncovered at a depth of 2.5 feet (Figures 2.8 and 2.9). This pit, which was excavated adjacent to the large stone to a depth of five feet, rapidly filled with water to surface level. Near the northwest foundation corner, a different test pit unearthed a cast iron building jack, which is further discussed in the "Materials Recovered" section.

During the second day of construction, a three foot wide trench (one bucket width) was opened to place the tile line. The trench followed the corridor where the previous day's test pits had been excavated. Most of the trench was placed well north of the site, where undisturbed soil profiles were revealed. In this area, the uniform yellow clay was interrupted only in one area, by a sub-plowzone pocket of sand nine feet in length and five feet deep. Within five meters of the northwest foundation corner, the area of disturbed strata began. In this area, the soil profile was marked by distinct, alternating dark and light bands 1/2 foot to one foot each in depth (Figure 2.8).

Figure 2.7. Tile line construction at site VT-AD-706.

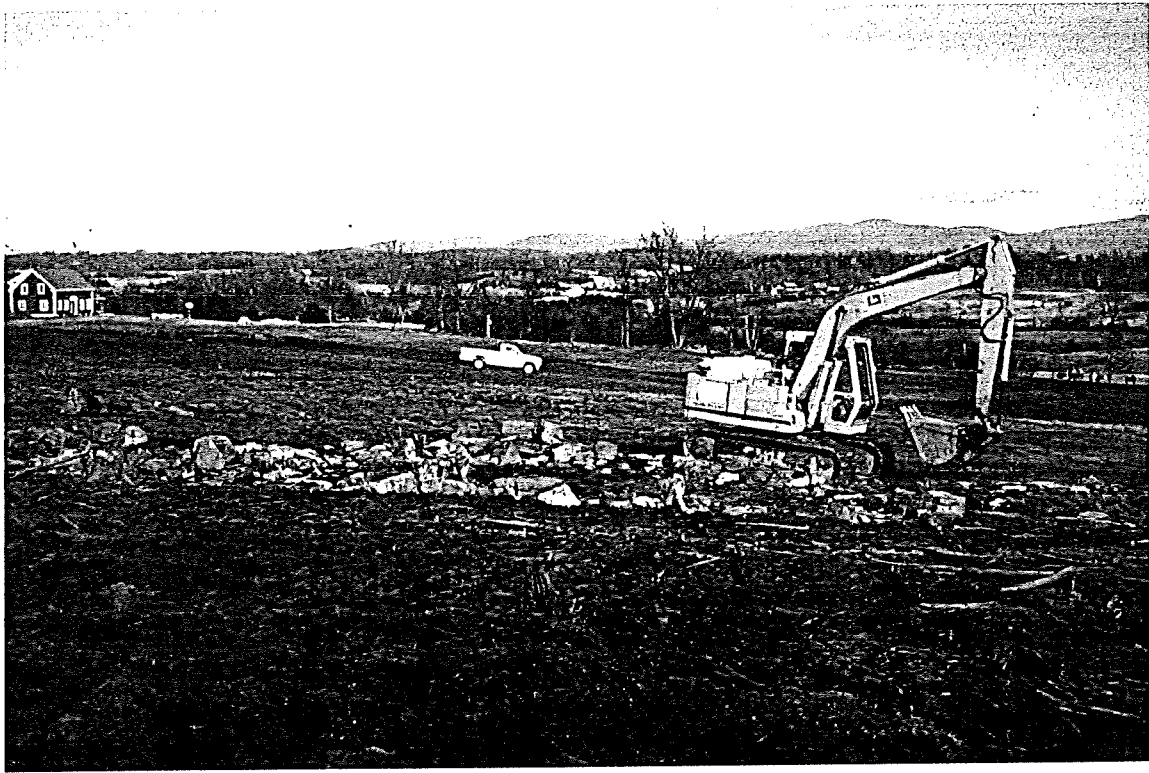


Figure 2.8. Disturbed stratigraphy (above), cut and rough construction stones (below) in construction backdirt at sit VT-AD-706.

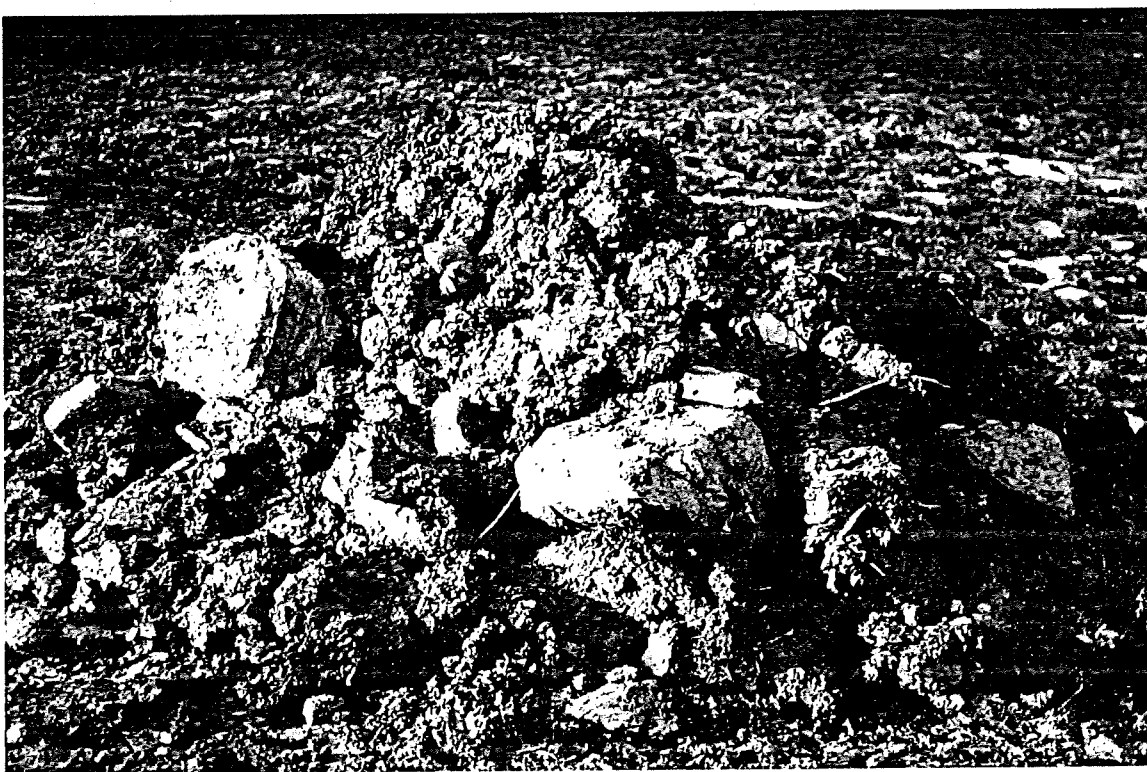
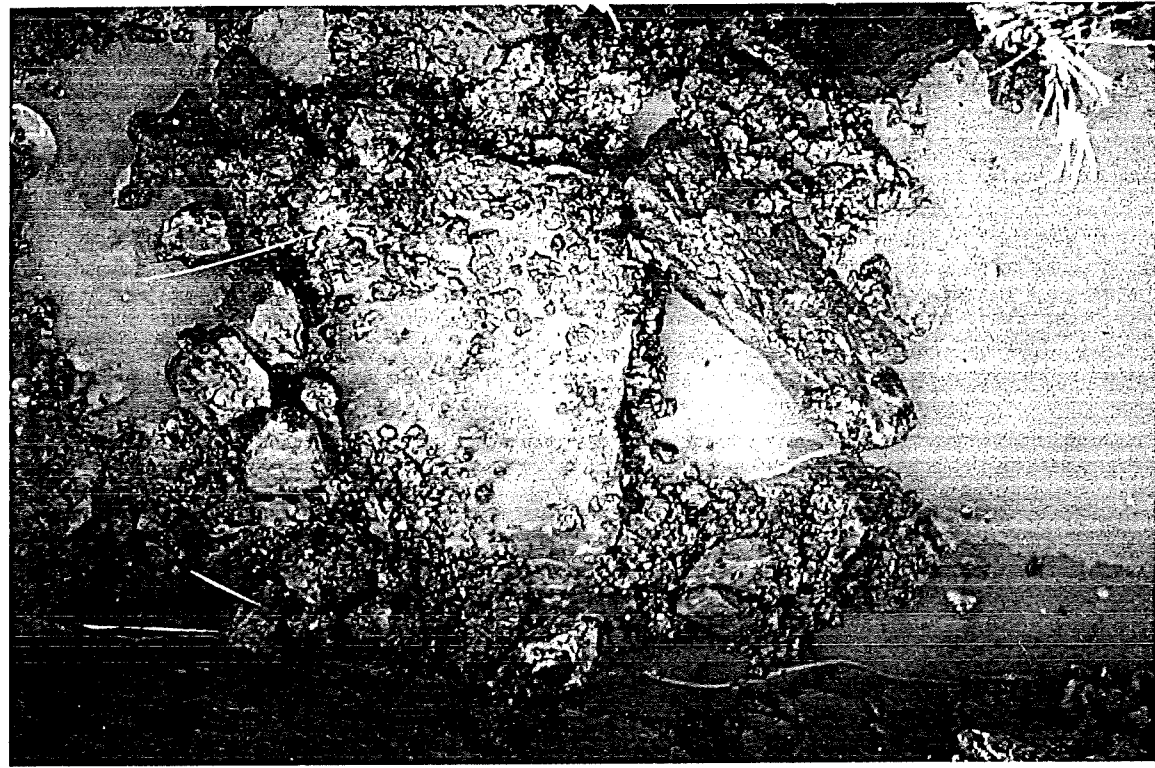
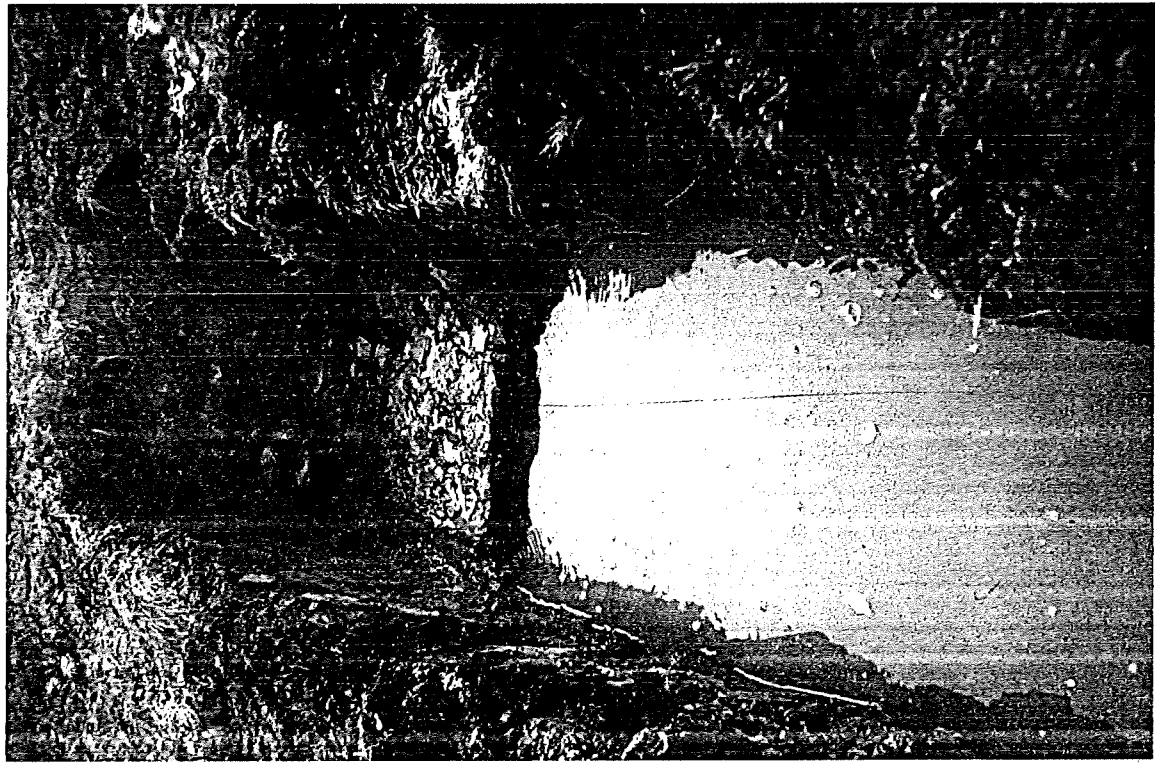


Figure 2.9. Cut stone blocks and portion of underground waterway encountered during construction.



Along the western edge of the foundation, the sloping, the bald-faced surface of bedrock was reached in the trench bottom at depths ranging from 3 to 4 1/2 feet, with the bedrock sloping higher to the south and lower to the north. The highest point of bedrock observed is located at nearly the exact center point of the west foundation wall. Near this point, the first of two underground waterways was intersected by the excavator. Water gushed from a six-inch diameter circular rock-lined feature in the west trench wall. A similar stone-lined circle without water was observed in the east trench wall. Water was apparently fed to the building from the southwest. The excavation was recorded on videotape.

As the excavator trench proceeded to the south of the foundation, the heavily disturbed stratigraphy continued, and an area of heavy historic debris was encountered (Figure 2.8). Numerous cut limestone blocks of various shapes were unearthed, along with a few brick fragments. Some heavily splintered wood boards suggest the inclusion of wood in the underground construction.

Near the southwest foundation corner, a second flowing waterway was intersected. It was difficult to determine whether and to what extent the existing bedrock was incorporated into the design and construction. Further to the southwest, a possible third underground waterway may be represented by a large, flat, cut rectangular stone. Investigation of this area was hampered by water which quickly filled the excavator pit. A few metal artifacts were unearthed and collected for analysis.

Materials recovered

A small collection of representative materials was made during the project monitoring/implementation phase: From the excavator trench: 1. cast iron jack; 2. two brick fragments; 3. a complete cut limestone slab; 4. an unidentified metal artifact, possibly a farm machinery part; 5. approximately 10' of wrought iron cable, similar to the type used to wrap upright cylindrical silos; 6. triangular door hinge; 7. strap hinge; and 8. ploughshare.

Materials recovered appear to reflect (1) equipment and building construction methods; (2) architectural-structural remains; (3) materials used for the foundation and underground waterways; and (4) artifacts reflecting miscellaneous farm activities, perhaps unrelated to the structure. These materials hint at the potential for further archeological research at the site.

Discussion

The Bissell Sheep Structure was probably built during the

1850s and involved deceptively complex construction techniques. The structure was probably too small and segmented to have been a full-fledged sheep barn. It was built to exact specifications, with integrated above and below-ground construction. Many available building materials, including cut limestone, brick, rough stone, wood and metal were used. It is also possible that existing bedrock was incorporated into its design.

Sheep washing was essential to the 19th century Merino industry, and the waterways and narrow endroom suggest that washing occurred at this site. It is probable, however, that the structure was also used for a variety of other purposes such as shearing and birthing. Archival records indicate that selective breeding was oriented towards producing a longer-staple, "less-greasy" sheep that did not require washing prior to shearing. The possibility thus exists that the structure was abandoned or converted to other uses late in the 19th century while sheep farming continued.

The sophisticated labor-intensive construction is generally indicative of the wealth produced by the Vermont sheep industry at its height. As mentioned above, this wealth is perhaps best-reflected by the domestic architecture, much of it in the Greek Revival Style, that still graces western Addison County. The Bissell Sheep Structure offers a glimpse of 19th century water management technology that is not recorded in historic documents.

Very few structures of similar construction have been investigated. The only two comparisons which may be made are from Vermont homestead sites that have been investigated through archeological study: Justin Morrill Smith Homestead, in Strafford, and the Lucius Lathrop Homestead, in Cambridge. The Justin Smith Morrill homestead, erected in 1850, consists of a Gothic Revival style house, farm outbuildings and gardens. Archaeological investigations were conducted there by Sheila Charles in 1990. The grounds include an artificial pond, and archeological excavations revealed a branching system of underground stone waterways connecting the pond to the house, barns and gardens. The construction combined large cut stones with smaller rough cut stones in a manner that closely resembles the Bissell site waterways. At some point in time, the stone-lined waterways were reconstructed using lead and then iron pipes. The stone construction, however, represents the earliest and most elaborate aspect of the water system (Charles 1990).

The careful excavations conducted at the Morrill homestead allowed a view of construction details not possible at the Bissell structure. Larger flat stones were used as capstones, while smaller rougher-cut stones and occasional bricks were used to build vertical supports. The large, flat stone encountered in

the excavator trench at the Bissell structure appears to have been a very similar example of a flat capstone, while the large amounts of rough cut stones and bricks removed from the excavator trench closely parallel the construction materials used at the Morrill homestead.

Relevant comparison may also be made with the Lucius Lathrop Homestead archeological site in Cambridge, Vermont. Its earliest construction dates to the 1790s. Archival and archeological research was conducted there by the University of Vermont's Consulting Archeology Program (CAP). Probate records of the site's longest occupant lists 35 sheep, 5 cattle and a horse. Archaeological excavations revealed two underground waterways connecting a natural spring to a large rock-filled pit (a cistern or holding tank) with an outlet channel which led to the river. One of the two waterways was stone-filled, while the other probably contained a log pipe (Nora Sheehan, CAP, personal communication, 1993). Nora Sheehan, project archeologist for the Lathrop Homestead site, suggests the large pit may have been a dairy or milkhouse location, with the spring water being used to keep a small superstructure cool enough for milk.

In the second part of the water system in Cambridge, two post holes were found that had been excavated through the channel, apparently as part of an outbuilding. The positioning and apparent size of this building are similar to small sheep washes that were also used during the 19th century. Illustrations of this building type, used where smaller flocks were kept, are present in the Rokeby Museum archives in Ferrisburg, Vermont.

The two site comparisons given above highlight some specific issues relating to Vermont historic archeology and the Bissell site. There are virtually no archival descriptions of certain sophisticated 19th century technologies such as water management systems. Technologies such as underground stone-lined waterways may have been commonly used and readapted in many cases for specific purposes. The three documented Vermont cases reveal how similar water technology was used in different contexts for domestic water supply, farm produce storage, ornamental gardening and sheep farming. Sites like the Bissell Sheep Structure allow new understanding of technological practices and advances that fueled the evolution of 19th century Vermont farming and industry. These important aspects of Vermont's heritage are not contained in historic documents, and the Bissell Structure (though only preliminarily investigated) illustrates why historic archeology is much more than a mere duplication of information available in archives.

The preliminary investigation of the Bissell site also raises many new questions. The structure's technology reflects ingenuity and labor-intensive construction, but the underlying

reasons for using this construction style are less clear. Were these waterways constructed in this sophisticated manner because they would require less maintenance and rebuilding over the long haul? This is possible because water still flowed freely through the long-abandoned Bissell system 140 years after construction! Or is it possible that these water systems represented a form of conspicuous overengineered ostentation that exceeded the technological requirements of sheep farming? This seems possible because the Greek Revival and Gothic Revival architecture associated with western Vermont sheep farming was oriented toward generating, and demonstrating, community status and social position.

Finally, it may be asked whether there exists a drainage system to the east of the Bissell foundation, and how elaborate and intact is that system? The comparative case of the ornamental gardens of Justin Smith Morrill is strongly suggestive of a status motive. Morrill was a U.S. congressman (1854-1866) and U.S. senator (1866-1898). Prior to his political career, Morrill was successful enough at commerce to retire at age 38. He then devoted five years of his life (1848-1853) to designing and constructing his cottage and ornamental gardens in Strafford, Vermont, which included many European and Oriental species (Charles 1990). Because Morrill was considered to be a serious student of landscape architecture, his underground stone waterways may be considered state-of-the-art technology of the era. The contemporary presence of similar technology on a prominent sheep farm suggests that E.N. Bissell was similarly interested in sophisticated and expensive state-of-the-art technology.

Conservation Issues: Historical Archeology on the Farm

Besides the specific research issues raised, the Bissell Structure investigations hold implications for historic archeological site conservation efforts on the Champlain Basin's farms. The site is an example of the important information sources that may be endangered by SCS earth-moving and pollution-control projects on farms. Currently, consideration of cultural resources depends wholly on SCS technicians and soil conservationists with limited ability and time to recognize and document historic sites. This is true despite the strong legal responsibilities to consider cultural resources during federally-funded undertakings by the National Historic Preservation Act of 1966.

Based on visual, surface evidence, the Bissell Structure appeared only as a non-descript, cut limestone foundation. Archival research and on-site investigation were required to reveal its significance and eligibility for the State and National Registers of Historic Places. Further comparative research hinted at its broad importance to Vermont history.

Although construction monitoring clarified some site aspects, controlled data recovery excavations would have produced much more information of significantly higher quality. This level of investigation was not attainable because of the system's current policy, staffing and funding limitations. Underground, the site size, including related midden deposits and underground construction, proved to be much larger than the superficial remains of the above-ground foundation suggested. Present nationwide SCS practices, such as the lack of input from cultural resource specialists during project planning and the lack of specialists to conduct historic or other of research, can only lead to the destruction of regionally and nationally important cultural resources like the Bissell Sheep Structure.

Finally, the Bissell Sheep Structure can be viewed as a case study in how significant cultural resources may be considered, and how a minimal level of protection and investigation may be accomplished through negotiation and compromise among the farmer, SCS and cultural resource specialists. Case studies such as this are necessary first steps toward the process of incorporating practical forms of cultural resource management into the SCS. Specifically, cultural resource success stories such as this one created positive attitudes and generated interest in local history and prehistory at the SCS field and state offices.

Farm #47 (June-October 1992)

This is a large, well-groomed farm with numerous historic cultural resources such as stone walls and a large W.P.A.-built (1930s) barn. The farm was visited with SCS field personnel, who designed and flagged a diversion. Directly in the path of the diversion was an early 19th century stone well, designated site VT-AD-703, which had long ago been filled with stones.

Historic stone wells qualify as cultural resources; they are especially prized by historic archeologists because they may contain a sampling of historic discarded materials that can provide a wealth of information about a site or period of time. Within the context of a farm with a variety of historic cultural resources, a seemingly unobtrusive feature such as a stone well may have substantial historic importance as it relates to other farm buildings and features.

The same contractor who inadvertently destroyed a prehistoric site at Farm #22 excavated this diversion. I was present during the construction, and the well, with a surrounding buffer, was flagged. The contractor adeptly maneuvered his excavator around the flagged area, and construction proceeded. The final diversion handily avoided the well, which was left in a sod island, with sod and brush removed all around it. At one point, the farmer asked what the contractor was going to do with

the old well and the contractor replied, "Absolutely nothing." The simple project redesign and monitoring did not slow the project or affect the functioning of the diversion. Without knowing how important this small, obscure cultural resource might be, it was recognized, avoided and preserved in place.

Farm #55 (June 1992)

A waste storage (manure) pit was planned for this small farm. The project area, located adjacent to an existing barn, was examined and found to be heavily disturbed. The project was allowed to proceed without recommendations. However, while walking along the edge of a cornfield to find and speak with the farmer, a large and dense prehistoric artifact scatter was found and designated site VT-AD-696. Although located on a high knoll overlooking one of the area's major rivers, the site was unrecorded and unrecognized by the farmer. When I finally found the farmer in his field, we discussed the site, and I was encouraged to record and report it to VDHP.

It was on this farm, through conversation with the farmer, that I realized how much preservation archeologists have in common with Vermont dairy farmers. The farmer expressed his concerns about earning enough to stay afloat, and his desire to keep his land from being sold off for development. We discussed how sites are preserved even if they are plowed, because most sites have been plowed for more than one hundred years. I finally left a VDHP pamphlet with the interested farmer.

Several months later, as I was surveying a project area on the adjacent farm, I was surprised to look up and see this farmer again, staring down from atop his tractor. He helped me look around, and we discovered that the same site continued onto the next farm. The farmer was typical in that, following initial caution, he displayed an active interest in archeological and historic sites after learning the specific goals and methods of the Archeology on the Farms Project.

Farm #77 (August-November 1992)

Of all the case studies presented, Farm #77 best illustrates the complexities of cultural resource management within SCS. The Farm #77 case exposed preservation issues existing not only within SCS, but also in the general and professional archeological communities as well.

Addison County, like most of America, has an archeological site looting problem, and in western Vermont that problem has been exacerbated by a lack of public awareness and a sometimes low public opinion of some professional archeologists. Virtually the entire Farm #77 is (or was) an archeological site, a mosaic of prehistoric villages and encampments from various time periods

(site VT-AD-2). Professional or semi-professional excavations occurred there on three occasions, in the 1930s, the 1950s and the 1970s, but almost nothing was published by the involved archeologists. The location's archeological richness is well-known to the general public, and it has long been a favorite artifact collecting area.

Several years before the Archeology on the Farms Project, the SCS designed and funded a waste pit on Farm #77. In perhaps the only archeological field activity ever taken by the Middlebury Field Office (prior to this project), the State Archaeologist herself conducted test excavations and evaluated a site prior to a farm project construction in 1987. This was the only no-cost way for SCS to get the necessary archeological survey accomplished.

One Friday morning, on my way out of the office to appointments, I was told about SCS technical assistance at this farm. I was unable to go immediately, and didn't connect the farmer's name to the well-known site because the farm had changed ownership after the waste pit was built. Four days later, I visited the farm with two soil technicians. A 200' x 75' area had been bulldozed to build a bunker silo. I picked numerous prehistoric artifacts from the 7' high backdirt piles lining the impact area. The project was neither SCS planned nor cost-shared. It involved spur-of-the-moment technical assistance consisting of only a few transit shots. The earth-moving would have occurred whether or not SCS had participated. The technical assistance was requested, performed and earth was moved all in the same day.

On introducing myself to the farmer, he asked if I knew who was digging up his land by the river. On inspection, we found 17 holes dug by looters into black, subplowzone midden deposits of the prehistoric village site. The farmer believed that professional archeologists could have done it. Numerous prehistoric lithics and pottery sherds were strewn about. The earth was still fresh, implying that the looting had occurred over the previous weekend. The looted area cannot be seen from the farmer's house, and was probably accessed by canoe. The looting occurred so close to the open riverbank that a great erosional problem was destroying both the farmer's pasture and the site. I explained that I would be willing to conduct a professional clean up of the looted areas, including (1) transit mapping the hole locations, (2) screening selected backdirt piles, and (3) refilling holes. The farmer agreed to this effort, and I urged him to reseed the area and post no trespassing signs.

Subsequently, a clean-up operation of the looted portion of the site was conducted. Mapping, screening of backdirt and refilling of holes lasted one entire day. Cleaning of soil

profiles revealed intact midden deposits beneath the plowzone to a depth of 50 cm in places. Backdirt sifting produced a collection of Levine stone tools, pottery, ground stone, bone, and enormous frequencies of waste flakes. The looted portion of the site thus was shown to contain a substantial Late Woodland occupation (ca. A.D. 1000-1500). As discussed in Chapter 2, the Late Woodland period is a poorly understood time during which the tropical cultigens corn and beans were introduced to New England from Mexico via the Ohio Valley. The research potential of the site is enormous, if portions of it can be preserved.

In the following months, looting continued at Farm #77, and I conducted further mapping and clean-up efforts. The site was posted, and I visited the area with State Police officers. I sent out word through my collector networks that the area was off-limits. As a result of this effort or because of oncoming winter, looting stopped for a time. However, similar looting activities accelerated at other nearby sites, and this trend continued during the spring of 1993. Looters have merely shifted their activities elsewhere as attention focused on Farm #77.

Analysis

Several important issues were highlighted by this case study. Primarily, the lack of awareness and understanding of cultural resource issues within the SCS field office prior to the Archeology on the Farms Project was underscored. Field Office personnel were unaware that federal funding and technical assistance are not distinguished in Section 106 of the National Historic Preservation Act. The office was unaware that it was working on the most famous prehistoric site in the county, despite the fact that the same office (with the State Archaeologist) had conducted fieldwork on the same site a few years earlier.

The case study also highlights structural SCS limitations in dealing with cultural resources. The farm project's rapid turnaround time was the result of an informal office policy of providing spontaneous technical assistance as requested by the farmer. Even during low-intensity assistance projects, cultural resources need to be considered by SCS. This particular situation involved the partial destruction of a well-known site with technical assistance from an office with unusually heightened awareness of cultural resource issues. The case thus points to the potential scope of unreported cultural resource problems elsewhere in SCS in Vermont.

The looting episodes alerted me to the magnitude of the problem in Addison County, as well as the need for stronger public outreach efforts to teach the importance of cultural resource protection. Widespread looting results where a public has not been sufficiently reached by the professional scientific

community. Some professional archeologists have not helped the local situation through the years by conducting excavations without producing reports or conducting public outreach efforts, and, in one well-known case, by losing artifacts from an archeological laboratory. The looting issue and public outreach efforts in Addison County will be further discussed in Chapter 4.

Farm #28 (May, November 1992)

This farm was the scene of two separate SCS projects. In May, 1992, a streambank stabilization (riprap) was surveyed and designed. At that time a small unrecorded prehistoric site, designated VT-AD-695, was found outside the project area. In November, 1992, a diversion was planned in a cornfield a few hundred meters from the river, and I visited the project area with an SCS technician. A second small site (VT-AD-709) was found adjacent to the project area. The site boundaries were easily visible because of the large area of plowed land. There was also a slight rise which coincided with the site. From this information, it was possible to set extra specifications on the project. I recommended that the diversion be placed as far to the south as possible at the edge of the cornfield, and that the spoil be pushed to the south of the ditch, away from the site.

This particular watershed contains a series of small sites that are strung out on slight rises and low-lying floodplain terraces. The pattern contrasts with the larger and higher elevation sites found in other Addison County watersheds. For this reason, although the individual sites of Farm #28 appear sparse and inconspicuous, the series of sites along the watershed have great research potential for the study of prehistoric settlement patterns.

The sites on Farm #28 were easily protected because survey and site documentation was conducted early in the planning process. In comparison, if the sites had not been discovered until late in the planning process, replanning and realignment of the diversion, involving survey, redrafting, reflagging, and marking of flags, would have required substantial time and effort. Diversion ditches in particular are "hit and run" projects for SCS, and early planning is the key to cultural resource protection.

Food Security Act (FSA) Spot-checks

One of the major late fall and winter SCS activities consists of conducting Food Security Act (FSA) spot checks of farm fields. These field checks are designed to determine whether a given field has soil that is considered highly erodible. The spot checks help formulate farm crop rotation

plans that minimize soil erosion. SCS technicians cover many miles of terrain on FSA spot checks, and thus are in an excellent position to note and report cultural resources if they can recognize them. As a result of the Archeology on the Farms Project, the soil technicians in the Middlebury office have spent 18 months learning about cultural resource issues and have gained site recognition skills. The next two case studies discussed are examples of the important cultural resources that can be documented during FSA spot checks by soil technicians with sustained training from a full-time professional archeologist in one field office.

Farm #29 (November 1992)

At this farm, a moderate to dense prehistoric artifact scatter (VT-AD-710) in a plowed field was located by two soil technicians during an FSA field spot check. In my absence, the technicians noted the site, were able to accurately define its boundaries, and collected a few representative artifacts. I visited the site later with one of the technicians and the farmers. During the visit, a point was found that suggests the site may be as old as 5-6000 years (early in the Late Archaic period). The terrace on which the site is located is adjacent to a now-dry streambed. The site is thus older than many county sites, and represents a little-studied time period. The site and its geomorphological surroundings may also allow important studies into the hydrological history of the area.

On a routine FSA spot check, and by knowing the basics of cultural resource management, soil technicians were able to independently recognize, define and collect a small representative sample of an archeological site. The site has great significance for its potential to produce information on a little-known prehistoric period and the accompanying paleoenvironmental conditions. The site illustrated how recognition of landforms, in this case, a dry streambed and adjacent terrace, can lead to recognition of significant cultural resources.

Farm #16 (November 1992)

A Middlebury soil technician (other than the two involved at Farm #29) reported a historic foundation and artifact scatter (VT-AD-735) that he saw during a routine FSA spot check. The technician also brought back a small sample of historic ceramics some of which indicated the site could date to quite early in the 19th century. I revisited the site, and spoke with the farmer, who was interested in having the site documented. A few more ceramics were collected out of a plowed field. The site itself was a partial gray slate foundation chinked with small irregular slabs and constructed totally without mortar. The stone footings of an abandoned road were also apparent.

A preliminary archival search indicated that a large house was built ca. 1783 by one of the town's founding families. During the mid 19th century, the local deacon lived there. The house had disappeared by 1946. Artifact analysis showed that while most of the artifacts dated to the mid and late 19th century occupation, a few artifacts were present from the pre-1800 initial house occupation.

This site would contain interesting information for researchers interested in the early English settlement of interior Addison County and the development of its small towns. A deacon's house could also provide insights into the mid-19th century lifestyle of a rural community leader. Historic sites like this can also provide useful information on commerce routes and access to material goods during that time. Once again, an alert SCS soil technician with a fundamental understanding of and interest in cultural resources was able to recognize and report a significant historic archeological site.

Farm #86: The Cycle Begins Anew

As this report neared completion in the spring of 1993, the new cycle of SCS projects began. On the first field project of the year, a prehistoric site (VT-AD-740) was found by SCS personnel in a project area. The site was recognized by SCS field personnel and the project flagging was moved in an attempt to avoid the site. However, the project flagging still passed through the site when I first visited the location, because, despite good intentions, the site boundaries had been incorrectly assessed by SCS personnel. The site appears to be a small, well-defined homestead. A shovel test revealed an intact hearth, with burned earth, stones and wood charcoal (identified as pine). The evidence of intact sub-plowzone deposits makes the site National and State Register-eligible. Project redesign was easily accomplished, because the eroding area was far from the site, and potential impact was only caused by the diversion outlet path. By outletting the diversion in the opposite direction into an existing tile line, the site was avoided. The redesign cost was \$100.

This project raises several fundamental issues. First is that cultural resource consideration, identification, and protection needs to be an ongoing process in SCS. Second, even the rare Field Office that has a professional archeologist on the team can accidentally destroy National Register quality archeological sites. In particular, the recognition of a site is meaningless if its boundaries are incorrectly defined and the site is subsequently damaged. This again emphasizes that identification of site boundaries is often a complex undertaking requiring extensive training, skill, and experience.

The third issue involves the responsibilities of the

Agricultural Stabilization and Conservation Service (ASCS), the sister agency which funds many SCS earth-moving projects. The project redesign was easily undertaken to avoid the site, but at an additional project cost. The ASCS position is that the farmer cost-share percentage remains the same, meaning the farmer must pay a portion of the cost of avoiding the site. The SCS General Manual and the National Historic Preservation Act are silent on this issue. It is, however, federal responsibility to avoid damaging significant cultural resources with federal funds or technical assistance. This may be further interpreted to conclude that, implicit in federal historic preservation law, there is federal financial responsibility for extra construction costs of site avoidance. ASCS thus should have paid the entire extra construction costs involved in protecting the site.

Even a comprehensive cultural resource planning system would not end the need to resolve the issue of extra construction costs of site avoidance. For example, Long Term Agreement (LTA) projects such as diversion ditches are often designed in advance on a topographic map without a field visit. Project redesigns will repeatedly occur as cultural resources are located in the field, often with modest extra construction costs. The County Executive Director (CED) of ASCS in Addison County raised the issue of ceilings and thresholds in paying redesign costs. If the avoidance redesign is expensive, then extra construction costs may upset carefully planned ASCS regional budgets. For example, a manure pit relocation due to a significant archeological site may force a change from gravity loading to pump loading, adding \$10-12,000 to the project cost. In these cases, other options should be considered, including data recovery of important archeological information from the site. It has furthermore been noted by SCS officials that, even if extra construction to protect cultural resources becomes a federal cost, an increased cost could conceivably force a project to be abandoned in favor of a less expensive project elsewhere.

Despite the potential problems, assumption of minor extra construction costs by the federal government is strongly preferable to passing on site protection costs to the farmers. In the particular case of Farm #86, the project went forward with a modest extra cost to the farmer. This case study thus became an example of a farmer being modestly burdened with part of the cost of a site protection practice that is a federal responsibility.

The larger issue is clear: ASCS has been shielded from cultural resource reviews because ASCS merely provides funding to SCS projects without performing field operations. Any systemic solution to the issues discussed in this report must include consideration of the ASCS role in project funding, and establish ASCS and SCS financial responsibilities when project redesigns are necessary to site avoidance.

Other Case Studies

In the spring of 1993, several more archeological sites were located in SCS farm project impact areas. These sites were all recognized by Middlebury Field Office SCS field personnel, highlighting the potential for intensively-trained SCS personnel to actively participate in cultural resource protection. The complexity of some of the new case studies, however, indicates the endless range of circumstances that may surround cultural resources in SCS farm project areas. Even when SCS personnel are successful in identifying sites, there is an ongoing need for active professional supervision, especially for site documentation, evaluation and management of complex cases.

A particularly complicated case occurred on a farm where a manure pit was planned because the farmer wanted to sell development rights to the Vermont Land Trust. The sale of development rights insures the farm against subdivision and development, and eases the farmer's tax burden. The Vermont Land Trust recommends an animal waste storage system (like a manure pit), which will enhance the possibility of acceptance of the farmer's application. On inspection of the project area, a large (approximately 12 acre) prehistoric archeological site (VT-AD-747) was discovered by SCS technicians. The site appears to have been a quarry on a valley terrace where glacial quartzite boulders were broken down for transport to other areas. A projectile point dated the site to approximately 4000 years ago.

The mapping of artifacts in one plowed portion of the site revealed more than 800 artifacts on the site surface, including flakes of several reduction stages, cores, and discoidal hammerstones. Artifact concentrations on the site surface suggest the presence of at least six workshop zones and a specialized, assembly line-like production of rectangular bifacial blanks or preforms. Test pits placed with a backhoe at the site (by SCS to determine depth of bedrock and soil permeability) revealed intact deposits and burned areas at the base of the plowzone.

The surface mapping and backhoe testing unquestionably documented the National Register eligibility of the site for (1) its integrity, and (2) its potential to produce important information on the poorly-understood prehistoric quartzite industry of western Vermont. Comparison with cliff quarries located high in the Green Mountains is another promising avenue of future research.

One issue raised by the site is the potential conflict between different resources and conservation measures, specifically in this case, a water quality project required by a land trust and the preservation of an archeological site. The

very measure that could provide long-term protection to the significant archeological resource, a land trust purchase of development rights, probably requires the destruction of a portion of that site. Does the unguaranteed possibility of preserving much of the site in perpetuity warrant allowing its partial destruction? Is the manure pit important to local conservation needs apart from the land trust application? Will the site's significance have enough clout with the land trust board to facilitate the farm's selection? The long-term nature of the case study reinforces the need for an on-staff archeologist to follow-up on long-term case studies.

In March, 1994, eight months after my departure from Vermont, the development rights to the farm were bought by the Vermont Land Trust, and a special archaeological easement was placed on the site. The need for the manure pit was waived, and the significant archaeological site gave the farm priority position for consideration and sale of development rights. In this case, the presence of an important site and its protection was positive for all parties involved: the farmer who desired to sell development rights, the archaeological community, the SCS, who brokered the agreement, and the general public.

Discussion of case studies

The above case studies illustrate the wide range of experiences that SCS technicians may have with cultural resources. They may deal directly with cultural resources and threaten or destroy them during their work. They may alertly redesign a project to avoid and preserve them. In the case of FSA spot checks, they may recognize and report previously unknown cultural resources of tremendous significance. A few important themes that cross-cut these case studies are worth noting. First, the sustained (18 months) training of SCS personnel during the Archeology on the Farms Project in cultural resource recognition and management led to the successful case studies described above. However, the 3-4 day formal cultural resource workshops which are the present norm nationally in SCS do not provide the knowledge or skills necessary to produce cultural resource success stories. Only longer-term contact with and supervision by professional archeologists can produce these skills.

It should be noted that the case studies indicate great progress through time at the Middlebury Field Office. Early case studies were difficult experiences for both the soil technicians, who may have thought that the archeologist was adding to their workload, and the archeologist, who thought he was being ignored. During the project's middle period, there were more active attempts to deal with cultural resource issues. Substantial head-butting occurred in the case studies at Farms #62 and #77, but in the former case, an innovative solution was arrived at,

and in the latter case, an in-depth attempt was made to analyze and understand the mistakes that were made. Finally, during the latter stages of the project, Middlebury SCS technicians took it upon themselves to incorporate CR management into their work routines, and took pride in calling attention to significant CRs. Despite notable progress, Middlebury field personnel are still not totally equipped in terms of time and expertise to properly report and avoid cultural resources.

The case studies also indicate some structural or institutional problems in SCS. Turnaround time on projects such as diversions may just be too rapid to permit effective management. The decentralized nature of SCS may allow local field offices to employ independent policies that are detrimental to CRs. Perhaps most important, the lack of professional archaeologists to develop and oversee a paraprofessional system may render impossible the identification of CRs early in the planning process. These case studies show beyond all else the paramount importance of early CR identification. Remedial CR protection after the fact usually produces an ugly case study with unhappy SCS employees and frustrated archaeologists.

The following chapter turns to a totally different side of the Archaeology on the Farms Project, the public outreach and education activities. Public approval of protection and public understanding of significance are two of the most important aspects of cultural resource management.

Chapter 3. Public Education and Outreach

Public education and outreach to farmers and the broader community was a significant aspect of the original project design. The project plan allowed flexibility about the scope and frequency of these activities, calling for "at least two public outreach programs" to be conducted. In contrast, over 40 programs were actually conducted in Addison County during the project period. This level of public outreach was not actively sought, but developed as people became aware of the project and expressed their interest in archeology and cultural resource protection. Outreach thus became a larger project component than originally anticipated in response to a public hunger for knowledge about Vermont's heritage. Public outreach was conducted for four segments of the public: (1) farmers, (2) planning and conservation organizations, (3) schools and historical societies, and (4) artifact collectors.

Outreach work first stressed the scientific importance of Addison County cultural resources, including potential research topics. There is much to learn about the area's past, both prehistoric and historic, and the past may never be known if public outreach efforts are not conducted or are unsuccessful. Second, outreach talks stressed that most site protection is voluntary, and that federal and state protection of cultural resources is extremely limited.

A third theme was that agriculture and archeology are not in conflict with each other. They may be classified as "strange bedfellows," in that farming or plowing most sites is considered a minimal impact. Archaeologists do not seek to take farmland out of production. In comparison, when farms fail, and subdivision or other development occurs, archeological sites may be destroyed on a large scale. Fourth, cultural resources were presented as a conservation issue, in the same terms used for soil, water, forests and perhaps the most apt metaphor, endangered species.

Outreach to Farmers

The large majority of project field time was spent on Addison County farms, and public outreach to farmers was an implicit part of these visits. Farmers received pamphlets and materials on archeology, including one written by State Archaeologist Giovanna Peebles and produced by the VDHP. These materials take the form of most-asked questions with their answers, such as what kinds of sites are in Vermont, and why they are important and should be preserved. The pamphlets are useful as supplements to informal interviews and as material reminders of the archeologist's visit.

Conversations were geared toward learning the farmer's general perspective toward and knowledge level of cultural resources. As discussed in Chapter 2, farmers generally view themselves as land stewards and are interested in archeology once some basic myths about archeologists are dispelled. Many farmers in Addison County have accepted federal government benefits, and some of their activities are thus regulated by the SCS. Because they risk losing benefits or having loans called in (although this is very rare), farmers are naturally suspicious when another potential regulatory agent, the archeologist, shows up with SCS field personnel. Despite this, there was only one case when substantial conflict occurred with a farmer (Farm #62), and even then, a compromise agreement was reached.

Many farmers engage in voluntary archeological site protection measures, such as leaving a site in permanent hay. One farmer has long left a site in sod out of an intuitive feeling that it was important. Another farmer traded less accessible land with a prehistoric site and wetlands to The Nature Conservancy for other accessible land, in an example of how both preservation and agriculture interests can mutually benefit from such transactions. One farmer (Farm #17) voluntarily allowed an SCS project to be scrapped when redesign proved difficult, saving a significant site.

Farmers generally knew about their archeological sites, but didn't know that anyone thought they were important. Similarly, farmers are aware of historic standing buildings such as barns, but tend to take their presence for granted. In some cases (see discussion of Barn Again!), it is difficult to utilize historic buildings in conjunction with modern farming equipment, and this remains an important impediment to historic building preservation. In general, the local presence of an archeologist demonstrated the importance of archeological site and historic building preservation. Interest and pride in archeological and historic sites were generated, particularly because of this project's commitment to work to complete redesigned projects without delays.

These few examples show the importance and effectiveness of simple outreach to farmers. There is, however, a concern that farm-by-farm site protection will disappear when the regional professional presence ends with the completion of this project. Probably the best way to avoid this is by initiating a voluntary stewardship program with landowners. In other states, landowners who join a stewardship program agree to protect their sites and are given a framed certificate attesting to their ownership of a protected archeological or historic landmark. The program encourages voluntary site protection in exchange for a certificate, which may become a community status symbol. In this manner, effective site protection may be developed for a modest investment. In the case of Addison County, a stewardship program

could continue the contacts and temporary positive trend in site protection that occurred during the project period. A Champlain Basin-wide focus for such a stewardship program would produce long-term and far-reaching results in voluntary cultural heritage protection.

Outreach to local organizations

Outreach work with some specific organizations is discussed because these groups are fairly typical of the local power structures of rural America. Awareness of cultural resource issues within these groups can develop into powerful, long-term forces for preservation and management.

Otter Creek Natural Resources Conservation District

Natural Resource Conservation Districts (NRCDS) consist of a board of supervisors made up of local farmers and landowners. NRCDS serve as the local guiding organizations for SCS. An NRCDS must exist in a region before SCS can operate there. These organizations must oversee and approve SCS actions and serve as communications facilitators between SCS, ASCS, University of Vermont Extension Service, and other county conservation organizations. NRCDS also conduct their own public outreach on soil and water conservation, particularly to elementary schools, described briefly below.

At their monthly meeting, the NRCDS supervisors meet to discuss the business of SCS, and its own community and internal activities. The Otter Creek NRCDS of Addison County graciously allowed me to routinely sit in their meetings and report on the Archeology on the Farms Project. These meetings were immensely useful for hearing news from around the county from SCS and its funding sister agency, ASCS, and for discussing issues and case studies as they developed.

The Otter Creek NRCDS connection was useful in other ways. It was probably the best way to learn about local conservation issues and to keep up with the activities of several local conservation organizations. It also became possible to incorporate cultural resource concerns into NRCDS public outreach, by adding archeology to their major annual public program, the Conservation Field Days. This program, held at the county fairgrounds, teaches about soils, forests, water and wildlife (and now, archaeological site) conservation to all county 4th graders. Each topic is taught by five instructors at 25 separate field stations scattered throughout the fairgrounds. This allows groups of 10-20 students to rotate between stations teaching different subjects. The format allows large numbers of students to be taught in small accessible groups. The addition of

archeology to this annual program is significant in that it allows cultural resources to be simultaneously presented as a preservation issue with various natural resources.

The Otter Creek NRCB supervisors became advocates of cultural resource protection. For both their 1992 and 1993 annual meetings, cultural resources was one theme. On another occasion, I gave the supervisors a guided tour of county archeological sites. The supervisors were represented at the two-day SCS cultural resource classroom training session. Their awareness of the issues is crucial to cultural resource protection in rural areas.

Addison County Regional Planning Commission

The Addison County Regional Planning Commission (ACRPC) is a large and somewhat unwieldy planning board that includes multiple representatives of all 23 towns and various organizations and special interest groups. The group is charged with producing a comprehensive long-term plan that balances all interests and political and social viewpoints. Subcommittees write plan sections and report back to the larger group at monthly meetings.

I occasionally sat in on the Natural Resources Subcommittee, which subsumed cultural heritage resources. A non-specific list of types of CRs was compiled, along with a general statement recognizing their historic, economic, educational and scientific importance and advocating their consideration in non-regulated construction and earth-moving activities.

A particularly interesting issue arose when the subcommittee statement was discussed by the commission at-large. I was visited by a commission member, who spoke with me about the dispute. At issue was whether or not archeological site mapping should be part of the regional plan. Essentially, people in favor of mapping felt that mapping is necessary to protect sites. People against mapping tended to believe that sites may be better protected if their locations remain unknown. There was an inference of possible infringement on private property rights when sites are mapped. There was also a question of access to site information if the county and towns had it. The actual argument may have been more complex, and several hours of complete Planning Commission meeting time had been spent discussing this specific issue.

At the meeting of the entire commission, I gave a 15 minute presentation on cultural heritage resources. I basically stated that site mapping is not an issue for a regional planning commission to address. Sites are being mapped sporadically, as they are reported by amateurs or found by professionals. It is

thus not up to the commission to mandate or not mandate site mapping activities. I explained the use of sensitivity models to alert potential earth-movers to the possibility of a site, and some of the attributes that may be used to produce a model. Site sensitivity models skirt the issue of exact locational data, which are exempt from the Vermont's Right-to-Know Law.

The commission's recognition and consideration of archeological sites as an issue was commendable. Exact language was recommended for their document, based on statements written by Giovanna Peebles for town plans: 1. Recommend that towns develop their own archeological sensitivity models, or utilize the county model; recognize that checking for sites early in the planning phase of construction is the best way to avoid needless destruction of sites and inconveniences to developers; and 2. Recognize the VDHP and State Archaeologist as a resource for both general information on archeology and specific site location information (particularly when a proposed project impacts an area considered to have high archeological sensitivity). The wording was accepted by the entire commission on a bipartisan basis without objection.

The important point to be made here is that the local presence of a professional archeologist became important when a dispute arose between political factions on protecting archeological sites. Fears were present that archeologists would interfere with progress or private property rights. I was able to defuse the fears and mediate the dispute only because I had developed local relationships with farmers and citizens of all political ideologies. It was in fact the conservative property rights advocates who asked me to mediate the issue. Maintenance of a local presence and diplomacy is thus supremely important to counteracting myths about archeology and effecting broad acceptance of cultural resource protection.

Some additional examples of public outreach with local organizations are presented in Appendix 1. This work with local conservation committees and museums illustrates a few organizations which can help build local public support for archeological and historic site protection.

Barn Again! Program

Although the focus of this project was on archeological resources, historic standing structures are an important component of the Champlain Basin's cultural heritage that require consideration and protection. Barns are an especially threatened resource throughout the Basin and elsewhere in rural America. The Barn Again! Program is administered by the National Trust for Historic Preservation out of its Denver office. The program is designed to help farmers preserve and rehabilitate their historic

barns, mostly by offering technical assistance. It is geared toward remodeling and reuse, and to changing the farmers' perception that an old barn is useless or outdated and needs to be demolished. The program has been centered in the midwestern U.S., but meetings early in 1993 were geared to introducing the project to Vermont.

The SCS is in a particularly good position to promote the historic preservation of barns, in general, and the Barn Again! Program in particular. Addison County farms are dotted with extraordinary 19th and 20th (and occasionally 18th) century barns with slate roofs, cupolas, and elaborate trimwork. I have attempted to connect farmers to Barn Again! as demonstration projects to try to get the national project involved in Vermont. The Barn Again! Project has pinpointed farmer perceptions of their barns as the key to this aspect of historic preservation. Conversations with farmers must show how a seemingly outdated barn might be altered or renovated to become useful for modern farming. Noone is in a better position than SCS field personnel to note historic barns, to ask about its present and potential uses, and, in general, to implement Barn Again!. SCS can also publicize the availability of Vermont state grants for rehabilitation of historic barns through the VDHP.

In one case study, a farmer with a pre-Civil War barn has planned its demolition. One plan was to place a manure pit in the original barn location. This anticipatory demolition might have occurred, as SCS personnel were unaware that it is prohibited in connection with a federally-funded project. The ban on anticipatory demolition is a recent amendment of the National Historic Preservation Act which has not yet been incorporated into the formal policy of the SCS General Manual. Secondly, the farmer planned to demolish the barn to make room for expansion of a nearby new barn. In conversation with the farmer, I asked whether some renovation could make the barn useful. We also inspected the barn interior, whose slate roof and structure are intact and very sturdy.

The problem in this case, according to the farmer, is the narrow width of the barn, which makes access to milking equipment impossible. Even use for heifers is difficult, because they may only be fed with a wheelbarrow, which, in the farmer's words, "gets ancient fast." Despite this, he agreed to think about potential options, and was impressed by the official concern and historic importance of the building. A folder describing this case has been sent to the Barn Again! offices in Denver as a possible Vermont pilot project.

Public Outreach to schools and communities

Public outreach to schools and communities covered a wide gamut of groups. Talks on Vermont archeology were conducted in classes ranging from 5th grade to senior high school, including after school visits to high school environmental clubs. Historical societies in several towns were visited. These talks tended to emphasize how archeology has become a sophisticated science, and thus why it is destructive to dig your own neighborhood archeological site. Included in this theme are aspects of spatial analysis of archeological features and sites, and special studies such as microscopic use-wear analysis of stone tool edges and analysis of plant remains by scanning electron microscope. Another theme was the bare outline of Vermont prehistory, including how little is truly known about important research issues such as the timing and circumstances of the introduction of tropical cultigens (corn and beans).

My personal perspective is to emphasize knowledge as the ultimate public benefit, and to explain that without basic site protection, no future research program can operate in the area to produce new knowledge. Destroyed sites are portrayed as lost pieces of the jigsaw puzzle story of the past. As part of this aspect of public outreach, two students from the Gailer School in Middlebury, a 7th and an 8th grader, worked with me one afternoon a week for several months. These students assisted in field surveys, spot-checks of known sites, lab cataloging of artifacts, and archeological sample preparation and sorting.

Another area of outreach was to respond to public requests for site checks. These cases ranged from farmers with off-project sensitive areas or sites to people who knew a dairy farmer I had visited to citizens who have found what they suspect to be an artifact or site. Several sites were recorded as an outgrowth of these contacts, and many county citizens who may not be directly connected to dairy farms but are interested in archeology or history were contacted in this manner.

A few clubs and organizations were visited. For instance, the Green Mountain Treasure Hunters Club is a group of metal detector aficionados. They are dedicated to finding lost belongings, such as rings and watches, for people who solicit their free help, or in scavenging beaches for rings and then attempting to return them. Members insist they do not hunt on archeological sites, and their code of ethics expressly forbids this. The club also holds its own "hunts" where planted items such as silver dollars are competitively searched for within a designated area, with prizes for those who recover the most items.

The feeling of club members is that metal detector aficionados are misunderstood, and that the activities of an

organized group are quite different than those of lone detectors who damage historic archeological sites. Stories were told of confronting non-club members who were looting a site, as they ruin the hobby for legitimate practitioners.

Talks to groups such as this emphasize two points. First, the VDHP wants to know who these organized groups are, in order to separate legitimate interests from those that are destructive to sites, and to be aware of the group in case a controversy should arise. Second, I explain that the group could be utilized as a resource, and could thus be a very positive force in historic preservation and research. This second point is especially true in the given case because a long discussion of metal detector types and technologies demonstrated the detailed and specialized knowledge that these people hold.

The important point to be made here is that one facet of public outreach is to contact organized groups, and to bring them into the fold where they may be positively utilized as a research or monitoring group. Organized clubs provide excellent forums to portray archeologists and historic preservationists as inclusive and friendly to the general public.

Outreach to collectors

As the VDHP has known and emphasized since 1976, outreach to artifact collectors is particularly important for several reasons. Collectors know more about localized site locations than anyone. They also hold information that could either survive or be lost with time. An attempt was made to teach collectors how to number their artifacts, keep a catalogue and draw maps, preferably showing specific surface artifact locations at a site. I furthermore tried to discourage digging of sites in favor of surface collection of plowed fields.

In working with collectors, meetings were held with informants with key information about area sites, general collecting and local looting activities. I quickly learned to define a long typology of collectors ranging from very positive to horrendously destructive. The most conscientious collectors (1) confine themselves to surface collection of plowed fields, (2) number artifacts, and (3) keep careful records and maps. A few of these people have been very helpful in compiling information on both recorded and unrecorded sites. Their collections will retain scientific value long after our lifetimes, barring loss of the accompanying documentation or fragmentation of the collection.

Working with conscientious collectors was a very positive experience. I was able to learn much about the practice of collecting and looting, and who is and is not in the local

"collecting fraternity." I found many collectors to be open to new information, and some to be voracious readers of any archeology books I could lend. Some collectors were eager to produce better maps and documentation of their artifacts, and numerous new sites were recorded. There are also good opportunities to reinforce the destructive consequences of subsurface looting. The potential information that could be recorded was barely scratched.

Unfortunately, work with collectors requires fairly steady contact, and is based on development of a personal relationship of common interest. This type of contact and information gathering cannot be effectively maintained without a consistent regional professional presence. While the VDHP tries to maintain contact with many collectors, the state's ability to adequately follow through on new contacts and collections analysis is limited by lack of resources.

Subsurface Site Looting

The most destructive collectors in Addison County are diggers who are ravaging large numbers of sites. They buy, sell and trade artifacts and keep no records. Some varnish their artifacts to make them shiny, negating any chance to perform special studies on them. Perhaps worst, they exhibit no interest in the artifacts except as objects, finds, or produce. Most of these people have had contacts with professional archeologists, and thus realize the destructive nature of their hobby.

One particularly destructive looter has even offered his educational services to local school systems. In a talk he gave to a local historical society, he incorrectly explained how arrowheads were made by dropping hot water on stones, among numerous wildly inaccurate anecdotes. This would be humorous, except that this is the type of person we leave public education to when a professional archeologist is not present in a region to help local teachers and students better understand their history and prehistory. Fortunately in this case, I was able to speak the next month to the same society, and correct the many false statements offered by the collector.

It was surprising and disheartening to learn of the extent of a subsurface site looting problem in an area where most sites are lithic in nature, and where relatively few sites are known to contain sub-plowzone midden and features. Subsurface looting appears to be carried out by a relatively low percentage of artifact collectors who are considered to be outside of the collecting fraternity. Looters tend to be furtive or evasive to other collectors, who generally maintain a strong fraternal interest in viewing and commenting on collections other than their own.

The site looting episodes and clean-up at Farm #77 were previously described. The looted sites are generally well-known to the public, and in Addison County tend to be a handful of the largest sites. Some professional archeologists bear some of the responsibility for this locally high level of looting. Collectors of all types repeatedly mention that professionals worked on a site and never published it, or that artifacts were lost from a local college's artifact lab. In this sense, several professionals gave the looters cause to ignore their entreaties for site preservation because of a local history of unbroken promises to provide research results. In one case of a particularly destructive looter, it was previously reported that the looter learned to dig for artifacts by happening across an old professional excavation that had never been backfilled! Backfilling excavations is considered to be one of the professional archeologists' fundamental, ethical obligations.

There are no easy solutions to the looting issue, but I believe there is more potential to control and reduce it in a place like Addison County than in areas where the sites contain more tradable and marketable items. Education of the general public, including much of the outreach discussed above, can have a cumulative effect of placing community pressure on a looter to curb the practice. A knowledgeable and concerned community can also better monitor sites. Contacted farmers are occasionally beginning to allow less access to their land. In the case of Farm #77, a well-publicized visit to the site with State Police officers sent out word through the collector network that the area was off-limits. These are a few ways to slowly combat the subsurface looting problem, which may be confined to relatively few people. A landowner with a view toward resource stewardship, and a well-informed community that cares about its archeological heritage are probably the most important tools for beginning to halt site destruction from looting.

Flotation Demonstration Project

A form of professional outreach to my peer archeologists is worth briefly mentioning. Part of moving to any state and working there professionally requires incorporation into the existing network. My primary specialization within archeology is archaeobotany, the study of ancient plant remains. It was thus surprising to find that no Vermont professional archeologists were utilizing current techniques to collect plant remains from soil and cultural deposits in investigated sites.

A private donation secured water flotation equipment, through which soil samples are processed to "float" charcoal and seeds from archeological sites. The demonstration of this technique, and its scientific results, has involved processing and analyzing plant remains collected from a few Vermont sites,

including the Revolutionary War encampments at Mount Independence. This technique will hopefully become a regular aspect of archeological research in the region. If professional archeologists are to press for cultural resource preservation and continued federal and public support for our activities, we must aspire to the highest quality of research, including detailed analyses of our materials and up-to-date special studies that will provide the best information about past lifeways and environments.

Chapter 4: Discussion and Recommendations

Improving the water quality of Lake Champlain is a priority for the states of Vermont and New York. To effect this, significant monies are being provided to farmers for storing and treating agricultural waste, a potential source of pollution. Numerous program commitments by federal agencies, such as the SCS and ASCS, have been made to implement projects to stem the tide of non-point pollution. However, these projects result in a potential conflict: improving water quality may result in the destruction of other resources, such as historic and archeological sites.

The Archeology on the Farms Project was a project based on a previous brief pilot program that focused on the issue of archeological site protection, particularly during the implementation of water quality and soil conservation projects. The project was conducted on the Vermont side of the Champlain Basin for several reasons. Vermont, and Addison County in particular, contains a higher percentage of farms requiring pollution control programs than the New York side of the basin. Also, the Vermont side of the lake contains a demonstrated, exceptionally high density of archeological sites, having served as a focus for human populations for nearly 11,000 years. These culturally significant resources include prehistoric Native American sites, and sites pertaining to the 18th century French occupation, French and Indian and Revolutionary Wars, and the region's earliest Euro-American settlement.

The resources are especially vulnerable because they are not easily identified and their cultural and scientific value have not yet been fully understood by the general public. By increasing the dollars that may be available for water quality projects, the Lake Champlain Designation Act has magnified the potential for destroying more of the Champlain Valley's rich and diverse archeological resources. Due to the accelerated danger to archeological sites in the course of implementing new water quality projects, innovative strategies are needed to ensure protection of these resources.

From November 1991 to June 1993, the Archeology on the Farms Project identified numerous archeological sites in or near farm project impact areas, documented a series of both successful and unsuccessful case studies (including negotiations, compromises and project redesigns), and conducted many public outreach and education programs in Addison County, Vermont. A background study based on the Vermont Archaeological Inventory site files in Montpelier helped understand some patterns of the area's archaeological sites, based on various geographic attributes. From these trends and the ensuing case studies emerged a pattern

of which types of farm projects are most likely to endanger archeological sites (see Part Two). Certain types of SCS earth-moving farm projects, like diversion ditches and streambank stabilizations, are more likely to endanger a site than other projects, such as manure pits and barnyards. However, all types of SCS earth-moving projects may endanger archeological sites on occasion. In accordance with these results, a series of recommendations are made which are designed to enhance site protection with the least possible intrusion into the daily operations of the SCS.

Specific Issues and Recommendations

The paramount recommendation based on the Vermont project is the incorporation of at least one professional archeologist on the state SCS in-house team. If implemented, the recommendations for reporting, record-keeping, and communication will minimize damage to cultural resources as SCS develops a compliance process for Section 106.

1. Incorporate a professional staff archeologist.

The preferred solution to SCS cultural resource problems is to incorporate professional archeologists into the day-to-day operations of the agency. Several federal agencies such as the U.S. Forest Service and Bureau of Land Management have incorporated specialists into their staffs to direct cultural resource compliance efforts. The remarkable range of issues and complexity of on-staff professional assistance. The long-term nature of some case studies requires the continuity of a staff archeologist to follow through. In a small state such as Vermont, a individual case studies documented by this project reinforces the necessity system of one professional archeologist overseeing a dispersed system of summer archeology students could perform most cultural resource-related tasks.

A professionally-run system would assure that cultural resources are protected early in the planning process, and that project delays are avoided. A paraprofessional program modeled after the U.S. Forest Service program could be considered by SCS policy makers. SCS could develop an intensive training program for selected field staff that is above and beyond the current national training program. Paraprofessionals may locate and report some sites, help assess archeological sensitivity of project areas, and integrate cultural resource concerns into project designs (such as implementing site avoidance). However, paraprofessionals cannot conduct archeological surveys to clear project areas. The use of paraprofessionals in a cultural resource compliance program should be carefully defined and professionally supervised.

In May, 1994, a professional archaeologist began working for Vermont SCS out of its State Office, as a result of the recommendations made here. It is hoped that the Vermont program will be a model for SCS in other states.

2. Implement a Required Waiting Period Before Earth-Moving.

The least successful farm project case studies occurred because in SCS projects, especially long-term agreement (LTA) projects, earth-moving may begin before archeological resources have been considered. In particular, spontaneous field visits by SCS staff to provide technical assistance may involve destruction of cultural resources. A required notification and waiting period of 72 hours between the farmer's request for assistance and providing that assistance would ease this problem, but only in conjunction with a consistent system of professional project area assessment before earth-moving begins.

3. Improve Communication and Record-Keeping.

Active and ongoing communication must be maintained between SCS Field Offices and VDHP. The primary responsibility for this communication rests with the SCS. In the absence of an SCS staff archeologist, such communication is paramount since it might at least serve to prevent recorded sites from being impacted. SCS should consider each farm as a unit of planning for cultural resources, just as it does other resources in formulating a LTA with a farmer. Under this concept, SCS should take responsibility for recording cultural resources, particularly archeological sites, and reporting them to the VDHP on standardized state site forms. In Vermont, there is a short form which may be rapidly filled out, with the site marked on an attached topographic map. Even sites located outside project areas (what I have termed additional resources) should be recorded for future protection.

Given this project's results, there is a strong expectation that field offices should continually report archaeological sites to the VDHP. An absence of site reports to the VDHP implies that sites are probably being missed by SCS staff and damaged by SCS actions. Information management and security is an important issue. State and field offices should have reasonable access to site location information, but an essential question is what constitutes "reasonable access?" Poor management of site information in offices can be extremely detrimental to sites. Determining the appropriate access of each office to this information requires extensive discussion between the SCS state office and the SHPO, and the development of specific protocols.

General sensitivity models based on various landform and geographic attributes may be used by the field offices as a

temporary measure until a formal professionally-supervised cultural resource system can be established. Use of these models by themselves, however, is inadequate because sites are also located outside high sensitive areas. Furthermore, when a project is found within an archeologically sensitive area, most field personnel (despite the workshops) lack the time and skills to adequately survey project areas for archeological resources. Lastly, a sensitivity model does not necessarily operate for historic archeological resources such as cellar holes and foundations (although some can be predicted by presence of travel arteries, etc.). These historic archeological resources may be located anywhere, and often require archival research to evaluate significance.

4. Implement Incentives and Enforcements.

A system of incentives and enforcements should be established within SCS and ASCS to ensure cultural resource protection. To begin, an SCS Field Office's accomplishments and workload are measured in terms of number of "practices" performed. A practice may consist of an SCS conservation recommendation that is implemented by a farmer, as well as a number of SCS funded or technically assisted construction projects. A variety of farm management projects (many of which do not involve earth-moving) are counted as practices in this accounting of SCS work. This system also serves to justify employee work time and the nature and variety of SCS work in a given area.

The reporting of any cultural resource, including at least submission of short forms with attached topographic maps to a state preservation office (like VDHP in Vermont) should be credited to the field office as a practice. This simple change in SCS policy will legitimize the time spent by SCS field personnel to recognize and record cultural resources. Currently, the identification and documentation of cultural resources by field office personnel is simply uncredited extra work.

Financial policy in ASCS and SCS should be brought in line with federal cultural resource laws, so that farmers do not bear the federal government's responsibility of protecting cultural resources. In particular, ASCS and SCS should provide funding for extra construction costs that result from protecting, avoiding or otherwise mitigating a cultural resource. Protection or enhancement of a cultural resource should be officially delegated as a cost-sharable practice.

Enforcements of cultural resource issues should be similar to those already in place for wetlands and highly erodible lands. This may require an amendment of federal law to provide the backing legal mandate, but it is the best way to insure cultural resource protection that is consistent with soil and wetlands

protection standards. Specifically, the violation of a cultural resource agreement between a farmer and SCS should potentially cost the farm its government benefits and risk the calling-in of federal loans. At issue is the "unit of analysis" problem discussed in the case study of Farm #62. In wetlands and erodible soil violations, the entire farm is considered the unit of analysis in sanctions and penalties. But current SCS policy is that cultural resource violations affect only the specific project involved and hold no ramifications for other projects and dealings with the government. The present policy leaves only weak incentives for either SCS or the farmer to protect cultural resources, even when specific LTA stipulations are made (Farm #62), or when anticipatory destruction occurs.

5. Monitor and regulate use of fill.

Some SCS projects require fill, and sometimes the fill is extracted from another portion of the farm. The extraction of fill may thus impact an archeological site that is not usually considered part of the project area. Inspection of one previous manure pit revealed early 19th century artifacts in the fill. In this case, it was stated by the landowner that "soil from within old foundations is good tight fill." Any borrow areas for fill (on-farm or otherwise) should be considered part of a project impact area to be inspected for cultural resources, and use of fill from historic or prehistoric sites should be forbidden in the General Manual and project contracts.

6. Recommendations for Other USDA Agencies.

SCS has two sister agencies within the United States Department of Agriculture (USDA) that are tightly linked to its farm programs. Both the Farmers Home Administration (FmHA) and the Agricultural Stabilization and Conservation Service (ASCS) provide funding to Lake Champlain farmers. Assistance from ASCS and FmHA has every bit as much potential for impacting archeological resources and standing historic structures throughout the basin (and elsewhere) as SCS projects. This study confirms that these two federal agencies are not presently complying with Section 106 of the National Historic Preservation Act in their programs.

ASCS is the funding source for many SCS farm projects. Thus, certain recommendations in this report, such as funding extra construction costs to protect cultural resources, are aimed at ASCS rather than SCS. While the results of this project are unlikely to influence national policy, it is important that SCS, ASCS and FmHA in the Lake Champlain Basin begin to discuss (1) their interrelated impacts on cultural heritage resources, (2) potential state or national policy changes, and (3) potential common solutions. At the national level, the National Conference of State Historic Preservation Officers and the Advisory Council

on Historic Preservation need to challenge the federal agencies that are not meeting their statutory obligations to cultural resource protection.

7. Prevent Impacts to Standing Historic Structures.

Considering and protecting historic standing structures should be a recognized goal when implementing farm projects. Pointing out the historic values of a particular barn or other outbuilding, for instance, should be an explicit part of the overall SCS farm plan. The historic value of a farm should be considered a source of pride rather than a liability.

Compared to archeological resources, historic standing structures are easily identified on Lake Champlain Basin farms. The rule of thumb is that any building fifty years old or older may be historic and eligible for either the State or National Registers of Historic Places. In many towns across the basin, partial or comprehensive inventories of historic buildings have been compiled. In some cases, such as in Addison and Rutland Counties, Vermont, published inventories are available for those field offices. In other cases, the State Historic Preservation Officer may be available to provide existing maps with indices of inventoried historic buildings.

Public Outreach Recommendations

The public outreach efforts of the Archeology on the Farms Project have produced important results. The local response to public outreach was strongly positive, indicating a thirst for knowledge of Lake Champlain's history and prehistory. The important role of public outreach to raise awareness of cultural resource issues and to create a climate for successful cultural resource protection is undeniable. Only outreach efforts may change the public perception that archeologists are against progress and seek to stop construction projects.

Outreach efforts in Addison County led to positive perceptions of cultural resource protection in town and regional planning, and greatly increased awareness throughout the county, if the increasing frequency of office messages and phone calls is an indication. The series of public outreach recommendations are designed to promote voluntary protection efforts and explain the public benefit of greater knowledge of the past. In rural areas, it is particularly important that public support for cultural resource protection cross-cut political factions and ideologies.

1. Continue Education and Outreach.

Continued outreach in Addison County depends on localized

permanence of professionals and outreach structures. Steps have been taken to regularize archeology participation in SCS Conservation Field Days, which reaches all county fourth graders. Public outreach should be an important function of all professional archeologists who become incorporated into SCS. The progress made in Addison County during the last eighteen months can be easily lost without the continuation of outreach. Public education efforts originating from Burlington and Montpelier have only minor impacts compared with what may be accomplished through a local presence.

2. Perform Archaeological Research.

Archaeological research is not a luxury, but a necessary part of any cultural resource protection program. Research allows local communities to become actively involved, and turns attention away from destructive site looting by emphasizing what can be learned through scientific survey and excavation of archeological sites. The galvanized support of the town of Orwell for the Mount Independence excavations stands as an example of the broad-based support that can be generated by research for cultural resource protection.

In the case of the Champlain Basin (and especially Addison County), with the exception of compliance-driven archeological studies, so little is known of the prehistory that preservation efforts are hampered. It is virtually impossible to protect sites if nothing is known about them. A view persists in Addison County that because little research has been performed, the sites and history they represent are inconsequential.

Lamenting the lack of local research is easier than recommending means for beginning research. Quality research requires institutional support, local stable professional presence, and a minimal infrastructure of laboratories and equipment. For example, Middlebury College, Addison County's only four year college, does not have an archeologist on its faculty and has no apparent interest in the discipline. Without the right people, resources, and sustained support, research and site protection in Addison County will remain an uphill battle.

3. Implement Stewardship Programs.

An obvious but enduring lesson from this project is that the farmer is the greatest potential land steward and thus, the most important person in archeological site protection in rural areas like Addison County. If a farmer thinks a cultural resource is important, then that resource will most likely be protected. For this reason, giving information to farmers was stressed throughout this project. Farmers with archeological sites received copies of a general information pamphlet on Vermont his

tory and prehistory and a copy of the State Archaeological Inventory form for their site.

An especially effective archeological resource protection program in other states has been a voluntary stewardship program for landowners. In other states, stewardship programs have awarded framed certificates signed by the governor to landowners who voluntarily protect their significant sites. Landowners may receive an annual or biannual visit to check on the site's status. Certificates may become a status item, with people actively inquiring about them. Landowners may withdraw from the program at any time. Favorable publicity is generated for cultural resource protection.

An archeological site stewardship program requires one full-time staff member and desk space. The payoff in terms of archeological site protection in other states has been enormous compared with the project's modest cost. The favorable response from farmers, other landowners, and citizens during the Archeology on the Farms Project strongly suggests that a stewardship program could be enormously successful in Addison County and elsewhere in the Champlain Basin. While a stewardship program affords only voluntary protection to an archeological site, a landowner may choose to donate or sell a conservation easement in perpetuity on a site. In an ideal world, perpetual easements that protect archeological resources within permanent agricultural lands or open spaces afford the greatest protection to a site.

Across the Champlain Basin, The Nature Conservancy and numerous land trusts, large and small, should become working partners with the State Historic Preservation Officers and interested citizens in ensuring long-term protection of cultural resources on Champlain Basin farms. Specifically, the presence of a significant archeological site or sites should be an important criterion in the selection process of land trusts that buy development rights.

4. Elementary School Textbook.

An elementary school (preferably 4th grade) text should be written that describes the prehistoric Native Americans of the Champlain Basin. Similar texts have been completed and are in regular school use in other states. The text should be carefully constructed and edited to be clear to its target age group. The book must counteract the many myths about Native Americans, particularly that Vermont was never inhabited, but was merely a hunting ground. The book also needs to refute the common notion that Native Americans represented a "primitive" lifeway. Perhaps the most important text message is to positively reinforce that Native Americans left us with a rich heritage that is worth knowing about and is important to having a complete local

heritage.

Elementary school levels of 4th to 6th grade are particularly important in public outreach. A high quality text for use by elementary schools throughout the basin could be a powerful long-term outreach tool for archeological resource protection.

Concluding remarks

The Archeology on the Farms Project has primarily examined the problems and issues of archeological resource protection in the context of federally-funded water quality projects. It appears that relatively minor but important staff and policy changes in federal agencies (SCS and ASCS) can produce major improvements in cultural resource protection, particularly in the preservation of archeological sites. However, local protection of these fragile, important resources is a wide-ranging problem with many aspects, including public perception and education issues.

In rural areas like Addison County, professional archeologists and federal agencies share responsibility for protecting cultural resources and for developing accompanying positive public perceptions toward those resources. Professional archeologists are responsible for supervising federal agency protection practices, and for building public support for cultural resource protection and research. Local organizations and institutions should support and reinforce protection, outreach, and research efforts. Federal agencies are responsible for supporting professionally supervised compliance with federal statutes and for reinforcing the importance of cultural resource protection in its public contacts.

PART II: CULTURAL RESOURCES OF ADDISON COUNTY, VERMONT

Addison County, Vermont, (Figure II.1) was chosen as the specific project location because it is a center of SCS activity in the Basin. The county exhibits a remarkable range of elevation, terrain, soils and landforms that have been highly conducive to prehistoric and historic uses. The high density of archaeological and historic resources in the county, including intact and significant prehistoric Native American sites and sites pertaining to the 18th century French occupation, French and Indian and Revolutionary Wars, and early Euro-American settlement, is therefore not surprising. These are especially vulnerable resources since they are not easily identified and their cultural and scientific value has not yet been fully understood by the general public.

This technical part of the report briefly describes the county and presents a preliminary archaeological sensitivity model. The physical descriptions of the land presented here owe much to the writings of University of Vermont archaeologists who wrote archaeological management studies for two Addison County watersheds (Thomas and Doherty 1980, 1982). Rather than repeat their extensive environmental descriptions of the county, the following summary discusses a few county characteristics that are most important for the present cultural resource study. Additional county description is included in the archaeological sensitivity model presented later in this section.

Topography and hydrology

Addison County includes portions of the Green Mountains and Champlain Lowlands physiographic regions. The large majority of county farms occur in the lowlands, described as "gently rolling, with broad low hills, lake shore terraces and fossil delta plains" (Howland 1974:10). Otter Creek, which drains about 9% of Vermont on its northerly route to Lake Champlain, is the dominant stream. Important tributaries of Otter Creek with large watersheds include the Lemon Fair and New Haven Rivers. Other important watersheds of streams flowing directly into Lake Champlain are Little Otter Creek and Lewis Creek. The Lewis Creek watershed, in the county's northern region, is of particular interest because it includes two upland lakes, Bristol Pond (a.k.a. Lake Winona) and Monkton Pond (a.k.a. Cedar Lake). These lakes, as well as a portion of Lake Dunmore in the southern part of the county, have apparently had very stable shorelines since the Pleistocene (Figure II.2).

The county seat of Middlebury (population 6000) lies at the county center at the first of six major fall lines of Otter Creek. Middlebury also represents a topographic break. North of

Figure 2-1. Location of Addison County in west-central Vermont.

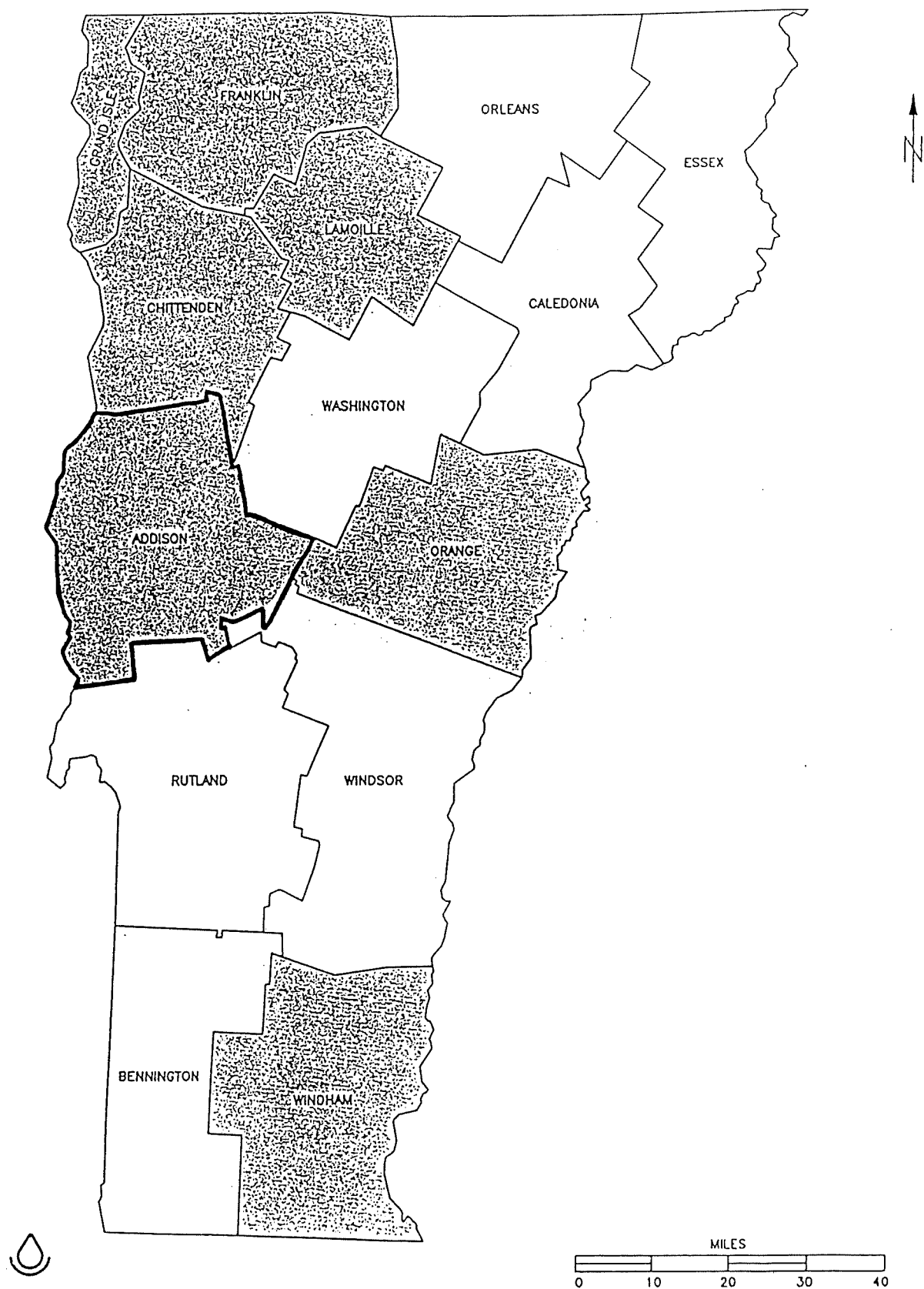
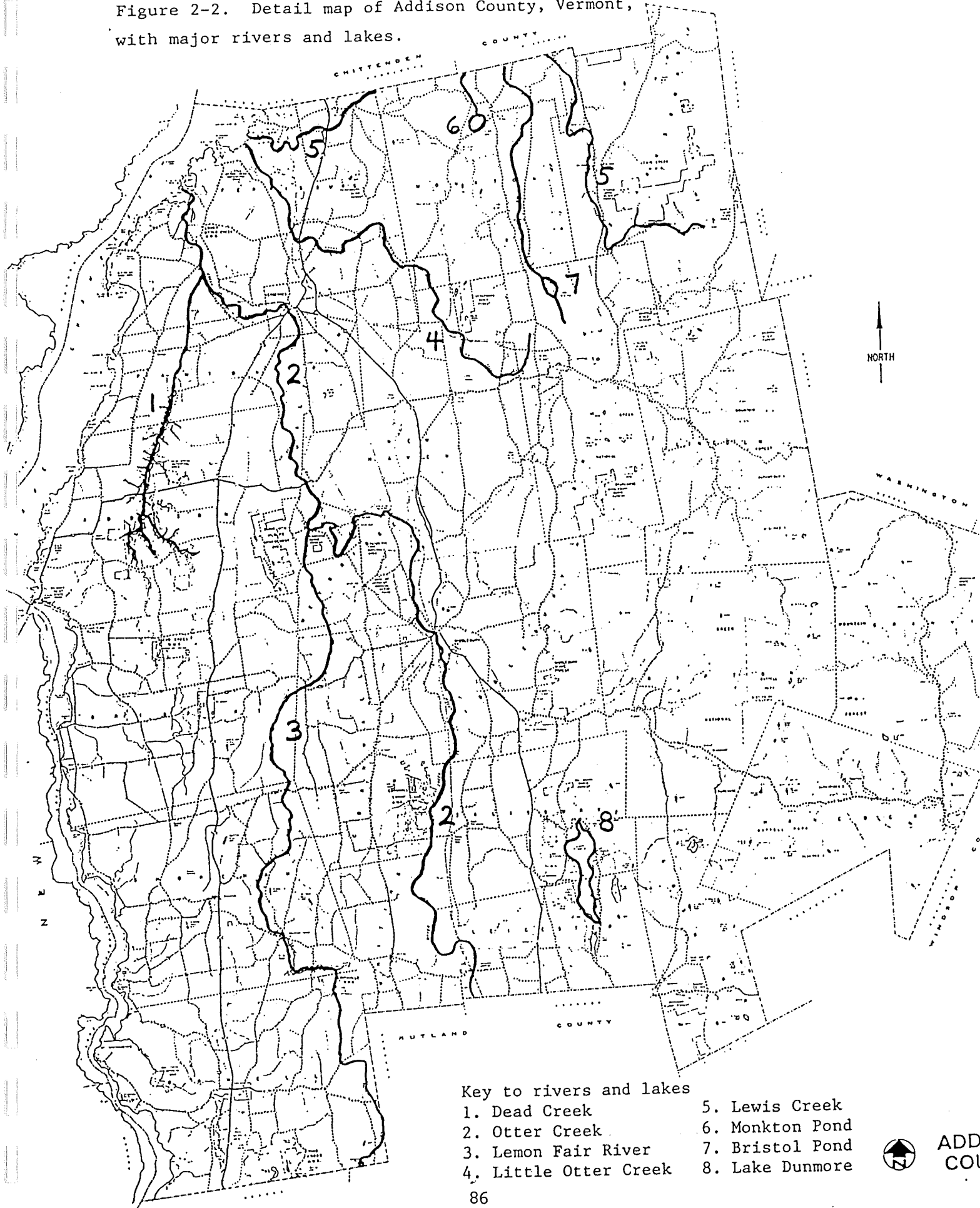


Figure 2-2. Detail map of Addison County, Vermont,
with major rivers and lakes.



Key to rivers and lakes

- | | |
|-----------------------|-----------------|
| 1. Dead Creek | 5. Lewis Creek |
| 2. Otter Creek | 6. Monkton Pond |
| 3. Lemon Fair River | 7. Bristol Pond |
| 4. Little Otter Creek | 8. Lake Dunmore |

Middlebury (downstream), clay and bedrock banks are high (40-50') above river level, while to the south (upstream), riverbanks are low and extensive wetlands are present. In this southern section of the county, a series of limestone knolls stands conspicuously within the Otter Creek floodplain and related large swamps. According to Thomas and others (Thomas et al. 1980; Stewart 1961; Stewart and MacClintock 1969), during the northward retreat of the last glaciers, between 13,500 and 12,500 B.P. [before present], western Addison County and virtually all of the Champlain Basin was submerged by an extensive freshwater lake, called Lake Vermont. By about 12,500 B.P., rising marine waters from the Gulf of St. Lawrence entered Lake Vermont, gradually producing the salt water Champlain Sea. For this reason, western Addison County soils are today dominated by lacustrine and marine heavy clays and silts.

Implications for cultural resources

The geological history of the area holds certain implications for archaeological site locations. Again, Thomas et al. (1980) have produced detailed discussions along this line, and the following is merely a brief summary. Important early sites of the Paleoindian period (ca. 11,000-9,000 B.P.) should be located in the upland regions of the eastern part of the county, where land was not submerged and lakeshores have remained stable. After Lake Champlain reached its approximate present form (ca. 8000 B.P.), certain watersheds with stable terraces, such as Otter Creek and the Lemon Fair River, would contain Archaic period sites (ca. 9,000-3,000 B.P.). Watersheds with streams that have meandered through time, such as the lower Lewis Creek area, would have scoured earlier sites and left exclusively more recent sites of the Woodland period (ca. 3000-300 B.P.).

Certain natural features would have had a strong effect on the county's prehistoric activities. As examples, the extensive quartzite outcrops of the middle and higher elevations of eastern Addison County, glacial erratic quartzite boulders on stream terraces in the center of the county, and black chert outcrops along the Lake Champlain shore in the southern portion of the county were long-term (or at least cyclical) centers of special quarrying activities. The extensive wetlands areas located throughout the Otter Creek, Dead Creek, and Lemon Fair River watersheds were rich wildlife zones, just as they are today, that held abundant and reliable food resources for thousands of years.

Summary of Vermont Prehistory and History

Despite its known archaeological richness, only the barest outlines of Addison County prehistory are understood. What little is known is based partly on (1) data from neighboring New York State, whose relevance to western Vermont is debatable, (2) information from artifact collectors and from professional

evaluations of private collections, (3) a few poorly reported (largely unpublished) professional projects, and (4) a handful of survey projects conducted under the legal mandate of Section 106 of the National Historic Preservation Act or Vermont Act 250.

The following outline represents a series of ideas, possibilities, conjectures and emerging research issues, rather than a well-understood prehistoric sequence (Figure II.3). It is compiled from various summary sources (e.g., Loring 1972; Pebbles 1989; Thomas and Doherty 1980) and presentations (e.g., Rossen 1992). For interested readers, the most complete treatment of Vermont prehistory is William Haviland and Marjory Power's *The Original Vermonters* (Haviland and Power 1981), now in the process of being updated. For the Early Historic or Contact Period, Colin Calloway's (1990), *The Western Abenakis of Vermont, 1600-1800*, is an important source.

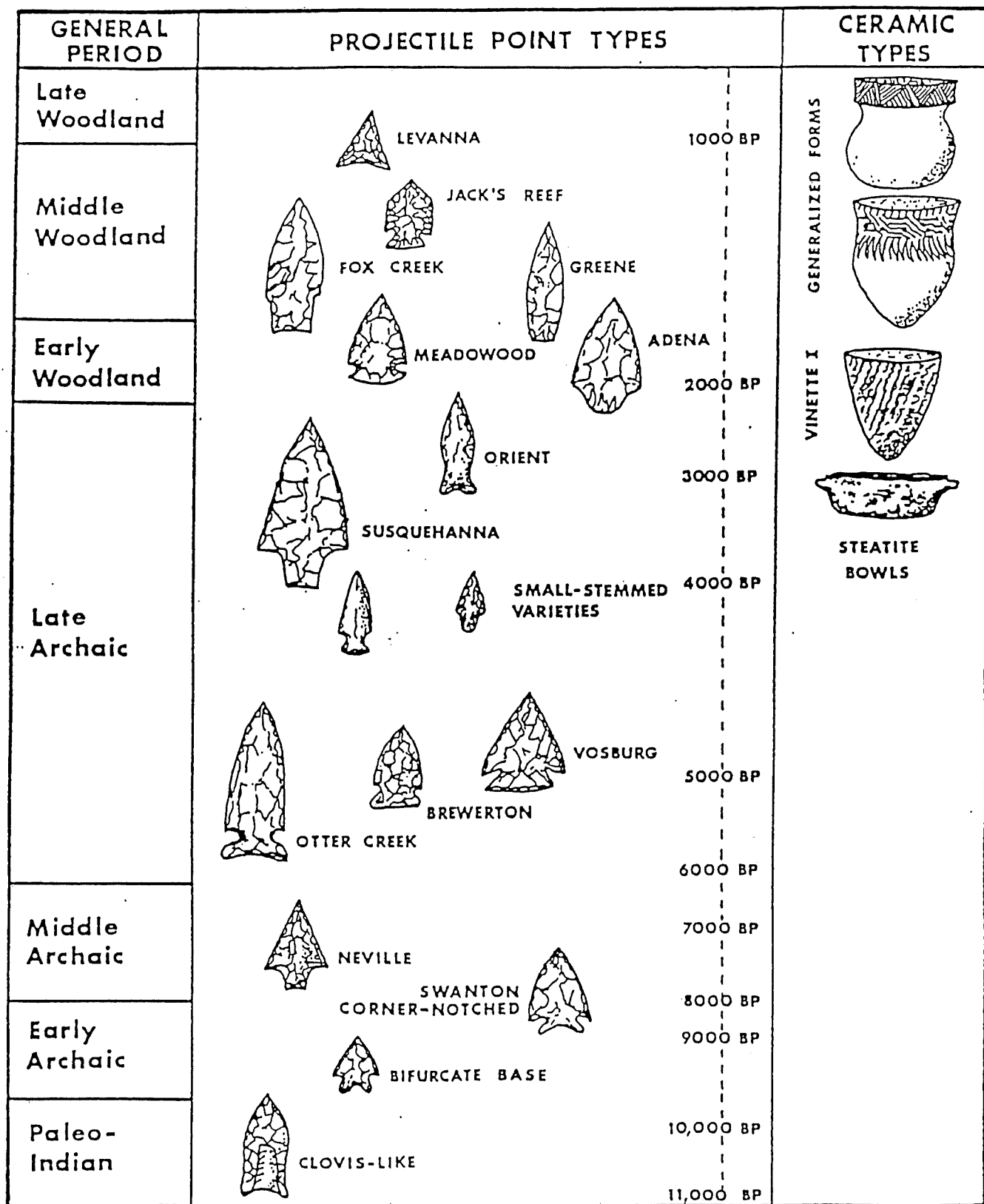
As a final introductory note to Addison County prehistory and history, a comment should be made about dealing with the past as a series of important events versus thinking about the past as processes of change. If events are emphasized, then individual people and places (or sites) are given paramount importance, and human history is viewed as only a loosely-integrated progression of isolated occurrences and a handful of people. If, in contrast, processes of change are emphasized, then all people and places, to some extent, participated in human history. When individual events and people are downplayed, then the broader stories of development, collapse, reorganization, and cycles of outward looking expansion-connection versus inward-looking isolation may emerge. Each site thus potentially represents part of a larger processual history, instead of an isolated record of individual events.

The subject of prehistory unjustifiably suffers when events are unduly emphasized, and its contributions to modern human knowledge cannot be fully appreciated. The resulting disproportionate interest in Euro-American history thus omits approximately 97% of the human occupation period of Vermont. The farm project on Farm #62, presented in Chapter 3, will also show how a processual approach to the past is applicable to Addison County Euro-American history.

Paleoindian period (ca. 11,000-9,000 B.P.)

This period represents the time when the first people probably arrived in the Champlain Valley. Small site size and sparse distribution suggests that they were highly mobile hunters and plant collectors, ranging widely over an arctic tundra-like landscape. Their distinctive fluted points and spurred scrapers are the key identifying artifacts of their sites. As will be discussed below, Paleoindian sites are extremely rare in Addison County and have enormous scientific significance.

Figure 2-3. Generalized artifact typology of Vermont prehistory
(from University of Vermont Consulting Archaeology Program).



Archaic period (ca. 9000-3000 B.P.)

During this long period, human populations changed their economy and developed new technologies and forms of social organization. By 7000 years ago, Vermont's plant and animal communities were much as we know them today. The economy diversified to broader hunting of large and small game, plant collecting and fishing. Stone tools reflected these economic changes in their diversity of points, knives, and fishing sinkers. Early in this period, or possibly during the Paleoindian period, the appearance of the spearthrower (or atlatl) was a major technological advancement that greatly increased hunting efficiency.

Later in the Archaic period, material influences from outside regions become more apparent. Ground slate and bone tools resembling technologies native to Canadian and Maine coastal maritime groups appeared. During the period of 6000-4000 B.P., according to former New York State Archaeologist William Ritchie (1989), a population influx occurred which he called the "Vergennes Archaic." It is possible, however, that he was merely attributing too narrow a time period to some of his identifying or "diagnostic" point styles, leaving the appearance of a time period with many more sites than either preceding or following periods. The Vergennes Archaic is still incompletely understood. The concept of a specific period of relatively high population and well-developed social order during the Archaic period remains an important issue to be confirmed or refuted by future research. Toward the end of the Archaic period, elaborate "Glacial Kame" burials with red ochre appear to signify increased social complexity marked by status differentiation.

Woodland Period (ca. 3000 - 300 B.P.)

This period is defined by the appearance of pottery. Exchange for items and materials (such as stone for producing tools) from as far away as Ohio and Labrador peaked during the early portion of the period. Distant influences also appeared in local imitations of the projectile points of the Ohio Valley Adena Culture, and somewhat later (ca. 2000 B.P.), pottery decorations similar to those in New York and Ontario appeared. Elaborate burial ceremonialism also peaked early on, perhaps reflecting periodic large gatherings, and declined about 2000 B.P.

During the Middle Woodland Period (ca. 2000-1000 B.P.), substantial warm season villages or series of settlements appeared, in a variation of the preexisting seasonal hunting-fishing-gathering round. Long-distance exchange continued, and new distinctive styles of pottery and points

appeared. During the Late Woodland period (1000-300 B.P.), new pottery and point styles again appear. New technologies such as the use of underground storage pits to store food allowed greater settlement permanence. The triangular Levanna point style reflects the important technological advancement of the bow and arrow.

At some point late in the Woodland period, life in Vermont was revolutionized by the arrival of the tropical cultigens, corn and beans, from Mexico and South America via the Ohio River Valley. Radiocarbon dates from a site on the Connecticut River shows that corn, beans, and squash were cultivated in Vermont by A.D.1100 (Asch and Petersen 1992). The exact timing, technologies, circumstances and ramifications of this massive social change in Vermont remain poorly understood, and thus, well-preserved sites of this time are extremely significant. As will be discussed in the sensitivity model section of this chapter, patterns in the site data from the Vermont State Site Files suggest that settlement patterns (or, the location and distribution of residential sites) changed substantially with the arrival of tropical cultigens. It appears that several sites exist in Addison County which could address this important research issue.

The Early Historic or Contact period, during the 17th century, is another important area of research. The arriving Euro-Americans affected the native populations before their actual physical appearance. A series of massive epidemics produced mortality rates estimated at 95% (Calloway 1990). Remaining people coalesced into a few villages along the Connecticut River or near the Canadian border. These remaining groups became entangled in the various French and British territorial disputes and wars of the period. Sites from this period may be among the most important and significant in the state, because the issues of human behavior and adaptation during confrontation, rapid social change and upheaval that may be studied at these sites are particularly relevant to today's world.

Historic Period (A.D.1609-present)

Previous researchers in Addison County have structured its Euro-American history in terms of the exploitation of available resources:

"Soil fertility, wildlife habitats, mature forests, rivers and accessibility were all factors that influenced settlement decisions made by the first white immigrants. As social and economic systems became more complex, interregional networks developed and the proximity of locally exploitable natural resources became less

significant. Transportation networks which could provide easy access to materials and goods as well as markets became important. The growth of those villages and towns established initially as subsistence settlements depended on their proximity to other population centers. Settlements became nodes of activity in a complex system connected by transportation and communication networks. Those networks ultimately expanded to connect Vermont with geographically larger areas-to regional, national, and in some instances, international levels" (Thomas and Doherty 1980:70).

Certain industries, such as the forestry, lime and charcoal production (Rolando 1992), are important specific aspects to plug into the broad conceptual framework described by Thomas and Doherty. The topics of railroads and lake transport/commerce have produced some recent interest in the county.

Probably the most conspicuous historical aspect of the county is its military history, as represented by the forts at Chimney Point and Mount Independence. Three summers of field school excavations at Mount Independence, an American fort in 1776/77 that was occupied by the British in 1777, represent the only extensive professional archaeological excavations conducted in the county in recent years (Starbuck 1991). The work barely hints at the scientific, educational and tourism potential of the Mount Independence site, jointly owned by the State of Vermont and the Fort Ticonderoga Association. It is worth mentioning that, while important, the military sites have received disproportionate scientific attention, compared to other county historic and prehistoric sites, because of their association with notable events and people, instead of broader processual change that archaeologists often emphasize.

For the Archaeology on the Farms Project, agricultural history is of particular interest. Addison County was the top sheep producing county in America by 1840. The Merino sheep industry of the 19th century generated tremendous wealth and power at its height, but proved to be unsustainable. As was discussed in the Farm #62 case study, archives tell much of the industry's economy, and much associated domestic architecture survives, but little is known of its farming technologies and architecture. Discussions of the sheep industry's demise have again surfaced as local dairy farmers currently wrestle with issues of their own sustainability.

A special kind of historic period site which we know virtually nothing about were those occupied by historic Native American families and communities. This type of site may include homesteads, seasonal or specialized camps, traditional use areas, and sacred sites, including burials. These are important sites that need to be identified and preserved. Oral traditions passed

down through generations in Abenaki families are an important information source for these sites.

MODELING THE PREHISTORIC ARCHAEOLOGY OF ADDISON COUNTY: A PRELIMINARY STATEMENT

Introduction

For various reasons, the development of archaeological sensitivity models for Vermont is fundamentally important. First, sensitivity models may be used to identify construction projects likely to threaten archaeological sites. The development of these models thus enables sites to be better protected. Second, systematic understanding of Vermont's long and complex prehistory is still at a preliminary stage. For this reason, compilations of the little information that exists, in the form of sensitivity models, may provide baseline data for developing designs for future research.

Archaeological sensitivity models involve the use of existing site location data along with suppositions on prehistoric land use and settlement to predict where sites would most likely be located. Environmental variables such as topographic setting, distance from water, slope, and soil type are often used in these models. The VDHP currently uses a sensitivity model that incorporates the above variables plus others, such as proximity to a stream confluence, to produce a archaeological sensitivity point score for a given land plot, but the effectiveness and practicality of this model (particularly for not underscoring or overscoring areas) has not been well-tested.

In reality, some model variables are more easily utilized than others. For example, while surface water is undeniably important to the placement of prehistoric settlements, distance from water may be difficult to estimate. Intermittent streams may not be apparent on topographic maps or easily visible in the field. Dry stream beds may indicate where water was present in the past, and springs appear and disappear in new locations through time. In contrast, variables such as topographic setting and soil type are more constant through time and easily assessed from topographic maps. Even the best sensitivity model will miss as many as 30% of the sites in a given region. A useful sensitivity model thus balances important and practical land attributes in order to make an educated guess concerning the location of a high percentage of prehistoric sites.

Utilizing the Vermont state site files (Division for Historic Preservation), data on 370 prehistoric sites in Addison County were recoded and computer analyzed. Exploratory statistics were performed on the data in order to isolate patterns in the recorded prehistoric sites of Addison County. The original purpose of this exercise was to produce an

archaeological sensitivity model for use by the SCS in preliminarily assessing the impact areas of their earth-moving projects. However, the data may also reveal patterns of prehistoric site distribution that relate to changing settlement patterns through time.

The sensitivity study reveals that a majority of Addison County sites that have been inventoried to date are contained within agricultural settings, and many of these sites may be subject to disturbance by agricultural practices such as construction of waste storage systems, water diversions and the placement of riprap in streambanks to control erosion. The goal of producing a sensitivity model is to better understand local patterns of site distribution so that sites and archaeologically sensitive areas can be avoided and left undisturbed during SCS construction activities. This model may also provide a foundation for similar, detailed models in other regions of the Champlain Basin. Finally, it is hoped that the data patterns presented here will help identify avenues of research and stimulate further interest in the poorly-understood prehistory of the Champlain Basin.

Previous archaeological research in Addison County

Research related to the prehistory of Addison County has been scanty. A brief survey of this work provides an understanding of how the data base utilized here was accumulated. From July to September of 1970, William A. Ritchie, for many years the State Archaeologist of New York, conducted surveys and test excavations throughout western Vermont, including Addison County. Ritchie recorded a sizable number of sites throughout western Vermont, but regrettably left few notes (e.g., Ritchie 1970). The Vermont work, however, did contribute to his projectile point typologies and chronology for New York state (Ritchie 1971). On this basis, Ritchie defined the Vergennes Archaic, a time of supposed heavy population of western Vermont at approximately 5-4000 B.P.

A few individual prehistoric sites have been the scene of repeated research efforts (e.g., Thomas et al. 1984), but the results of many projects have gone unreported. For example, the Rivers site in Ferrisburg was excavated on at least three occasions, 1931, 1954 and 1972, and efforts continue to bring together and publish that research (Louise Basa, personal communication). In the 1980s, a series of resource management studies was carried out by the Soil Conservation Service as part of its federally mandated cultural resource responsibilities during watershed planning. Studies were completed on the Lower Otter/Dead Creek (Thomas and Doherty 1980), Lemon Fair (Thomas and Doherty 1982) and later, the Lower Lake Champlain (or Lake Champlain direct) (Frink 1987) watersheds. These studies include prehistoric archaeological backgrounds based on other areas of

New England and New York as well as useful summaries of the physiology, geology, flora, fauna and climate of Addison County.

Two archaeological surveys related to impending construction projects contributed substantial numbers of sites to the Addison County files: the proposed Middlebury By-Pass highway (Thomas and Robinson 1980) and the Champlain Gas Pipeline Project (Robinson et al. 1991, 1992). An important contribution to the site files came from the 1978 and 1984 Vermont Collections projects, during which collectors throughout Vermont were interviewed and collections were photographed and documented (e.g., Loping 1978, 1984). Sporadic work with Addison County collectors has continued, and local collector reports are the primary source of the site data utilized here. Archaeological researchers in Vermont are indebted to those collectors who carefully recorded site locations and artifact information in the course of their surface collecting.

Summary Data - All Sites

The following discussion of cultural components follows a standard generally-accepted chronology of Paleoindian (11,000-9,000 B.P. [before present]), Archaic (9,000-3,000 B.P.) and Woodland (3,000-400 B.P.) periods. This convention is used for most of the northeastern U.S., and while it represents some well-defined changes in lifeway, technologies, settlement pattern and population size and density, the periods are more used as arbitrary delineations of time for organizing information. Regional prehistories and sequences of change and development vary greatly throughout the northeastern U.S., but the Paleoindian-Archaic-Woodland sequence remains useful as a fundamental timeline from which to develop detailed regional research and interregional comparisons.

A total of 217 temporal components has been recorded for Addison County. Included is an equal proportion of Archaic (n=104, 47.9%) and Woodland components (n=105, 48.4%). The remaining eight components are Paleoindian. There is a remarkably even distribution of components, which may surprisingly suggest that the known sample is not heavily biased toward a particular time period. That is, there is virtually the same number of single component Archaic and Woodland sites as multiple component Archaic-Woodland sites:

single component - Paleoindian	4
multiple component - Paleoindian and Archaic	4
single component - Archaic	54
multiple component - Archaic and Woodland	53
single component - Woodland	52

This distribution of site components will be important toward the end of this analysis when the characteristics of sites with

Archaic components are compared to those of Woodland sites. The comparative data lead to certain hypotheses concerning the culture history of Addison County. First, some general trends in site size and location are discussed.

Site Data Categories

The Vermont Archaeological Inventory files at the VDHP contain substantial data on recorded Addison County sites for nine categories: site area, surface artifact frequency, elevation, topographic setting, slope, present land use, drainage system affiliation, perceived threat to site, and soil type. Some categories, such as site area and elevation, are quantitative, while others such as surface artifact density are qualitative and categories such as "perceived threat" are subjective. Despite variability in the quality of available information and the frequency of sites with information on each category, the data may be used to preliminarily infer, and thereby predict, size, density, and distribution of as yet unrecorded Addison County prehistoric sites.

Site area

Site area was documented for only 86 sites (Table II.1). There are three classes of site size that dominate: 16 sites are in the 1001-5000 sq m class ($1/4 - 1 \frac{1}{4}$ acres), 16 in the 10,001-20,000 sq m class ($2 \frac{1}{2} - 5$ acres), and 24 sites in the 20,000-50,000 sq m class (5-12 acres). These three classes encompass 65.1% of all sites. There thus appears to be a pronounced dichotomy in site size, with relatively few sites in the middle range, roughly between 1 and 2 acres in size. Larger sites are more easily located and are favored by collectors, perhaps accounting for the bias toward large sites in the files.

Peter Thomas (personal communication 1993) urges a cautionary note on the discussion of site size. He believes that site sizes have been systematically overestimated in the site files because non-professional reporters have recorded the field size or management unit instead of the site size or cultural unit. To whatever extent this is true, there is certainly an issue of lumping versus splitting in the site file records. Peter Thomas believes that two or more sites may often be lumped together, giving a false impression of an extremely large site. Conversely, there are clear-cut cases in Addison County of large sites that have been split into several site designations. These sites appear as contiguous circles on the site file maps. Some of these sites were apparently recorded as the size of a particular plowed field showing artifacts. When the adjacent field was later plowed, another site was recorded, although in fact it was merely an extension of the previously recorded site. The Farm #2 case study explores some of the site management and protection implications of this problem.

The difficulties of determining site size are compounded because Vermont sites tend to contain several artifact clusters interspersed with areas without artifacts (or hypothetically, deposits) (Thomas 1986). Thus, a reportedly large site may deceptively have non-artifact bearing areas within it.

Surface artifact frequency

There is a pronounced dichotomy in surface artifact frequency (Table II.2). The greatest percentage of sites (42.6%) contain only from 2 to 50 artifacts on the site surface. Relatively low percentages of sites fall into the intermediate frequency classes of 50-150 and 150-500 artifacts (8.5% each), but a substantial percentage of sites (31.9%) have high reported frequencies of more than 500 artifacts. The pattern suggests that there may be a dichotomy between smaller special activity sites (represented by sites with 2-50 surface artifacts) and larger seasonal habitation sites (represented by sites with 150-500 surface artifacts). Addison County may thus contain an adequate archaeological data base for conducting detailed settlement pattern studies.

Elevation

Elevation is a random site characteristic between 100 and 600 feet above sea level. The mean (282') and median (275') values of recorded sites are virtually equal, and the standard deviation (150) is greater than one-half the mean, which is a statistical indicator of randomness. This merely means that sites are equally likely to be located at any elevation between 100 and 600 feet. Only one site is located above that elevation, probably because fewer plowed fields are present at higher elevations, and thus, these areas are much less frequented by collectors. Despite this pattern, ongoing research by U.S. Forest Service archaeologists David Lacy and Shelley Hight in Rutland County has demonstrated the strong potential for significant archaeological research at Vermont's higher elevations.

Topographic setting

The most common topographic setting for sites is the floodplain (27.9%), followed by terraces (19.7%) and knolls (18.8%) (Table II.3). These three settings together account for nearly two-thirds (66.4%) of all sites. A small but interesting and potentially significant minority of sites is located in unlikely settings such as hillsides (6.8%) and uplands (4.1%). No topographic setting in Addison County may be automatically considered to be devoid of archaeological sites, although some may have substantially lower site frequencies than others. Again, differences in site setting by time period are discussed in a later section.

Table II.1. Site area, Addison County recorded sites.

square meters	#	percent
1-200	2	2.3%
201-500	7	8.1%
501-1000	6	7.0%
1001-5000	16	18.6%
5001-10000	7	8.1%
10001-20000	16	18.6%
20001-50000	24	27.9%
50000-100000	4	4.7%
>100000	4	4.7%

Table II.2. Site density, Addison County recorded sites.

site density type	#	percent
isolated find	12	8.5%
2-50 artifacts	60	42.6%
50-150 artifacts	12	8.5%
150-500 artifacts	12	8.5%
>500 artifacts	45	31.9%

Table II.3. Topographic setting, Addison County recorded sites.

setting	#	percent
floodplain	95	27.9%
terrace	67	19.7%
knoll	64	18.8%
streambank	29	8.5%
hillside	23	6.8%
lakeside	19	5.6%
pondside	17	5.0%
upland	14	4.1%
marsh/swamp	3	0.9%
island	2	0.6%

Slope

Slope is, as expected, a very good indicator of site presence. A large majority of sites are located on 0-3% (40.3%) or 3-8% slopes (42.6%). Only 17% of sites are associated with slopes of greater than 8%, and many of those appear to be quarries.

Immediate setting/present land use

This category underscores the primacy of agriculture in Addison County land use (Table II.4). A vast majority of all the county's recorded sites (77.3%) are contained within agricultural settings. The trend is primarily a factor of where collectors search for artifacts. Nonetheless, this emphasizes the importance of focusing site protection on farmland settings, which is was primary goal of the Archaeology on the Farms Project.

Drainage system affiliation

Although major rivers (33.7%) and year-round streams (37.0%) are the most common drainage affiliations, a surprising percentage of sites are located on intermittent streams (10.5%) (Table II.5). The lack of surface water in an immediate area does not by itself indicate low archaeological sensitivity, according to these data. Though highly sensitive, pond shores and the Lake Champlain shore cover a relatively small area of the county and are thus represented by low percentages of sites. While natural springs presumably focused prehistoric land use, the site files rarely note this type of water source.

Site density over the landscape

An analysis of site density by watershed allows insights into the uneven reporting of sites in Addison County. The analysis also provides strong suggestive evidence of areas where many unrecorded sites should be located. Table II.6 lists the eight Addison County watersheds and the percentage of recorded sites in each, while Table II.7 is a more in-depth depiction of each watershed's recorded site density. Watershed sizes were computed using an electronic planimeter. Some watersheds are not totally contained within Addison County and Table II.7 includes only portions of watersheds within the county. (Areas beyond the county boundaries are not covered by the Middlebury SCS field office.)

The Little Otter Creek watershed has the highest percentage and greatest density of recorded sites, despite being the second smallest watershed in total area. Little Otter Creek does not have the well-developed terraces and knolls or wide floodplain of other county waterways such as Otter Creek and the Lemon Fair

Table II.4. Immediate setting/present land use, Addison County recorded sites.

land use	#	percent
agricultural	218	77.3%
woodland	26	9.2%
recreational	16	5.7%
residential	8	2.8%
conservation area	6	2.1%
state park	6	2.1%
industrial	2	0.7%

Table II.5. Drainage system affiliation, Addison County recorded sites.

drainage type	#	percent
year-round stream	123	37.0%
river	112	33.7%
intermittent stream	36	10.5%
pond/lake shore	27	8.1%
Lake Champlain shore	26	7.8%
spring	9	2.7%

Table II.6. Frequencies by watershed, Addison County recorded sites.

watershed	#	percent
Little Otter	88	24.8%
Dead Creek/Lower Otter	78	22.0%
Lake Champlain direct	55	15.5%
Lewis Creek	48	13.5%
Middle Otter	39	11.0%
Lemon Fair	35	9.9%
Middlebury	6	1.7%
New Haven	6	1.7%

Table II.7. Recorded archaeological site density by watershed.

watershed	square miles	#	site density/mile
Little Otter	73.7	88	1.19
Dead Creek/Lower Otter	103.1	78	.76
Lake Champlain direct	81.8	55	.67
Lewis Creek	81.2	48	.59
Middle Otter	80.0	39	.49
Lemon Fair	92.0	35	.38
Middlebury	62.7	6	.10
New Haven	120.5	6	.05

Table II.8. Perceived threats to Addison County recorded sites.

threat	#	percent
agriculture	153	49.5%
vandalism	58	18.8%
development	43	13.9%
erosion	31	10.0%
no threat	16	5.2%
other	8	1.6%

River. The high site density of the Little Otter watershed is primarily the result of the efforts of a few collectors who have recorded many sites there. The very high site densities of a few areas where intense collecting has occurred underscores the need to comprehensively inventory watersheds in order to produce meaningful site density data.

Without assuming that all sites have been recorded in the Little Otter watershed, it may be hypothesized that the recorded Little Otter site density represents a minimum density for nearby larger watersheds. Reports from farmers on SCS baseline surveys also suggest that many unrecorded sites are present in the Otter Creek and Lemon Fair areas. In comparison, Lewis Creek is a very small waterway with a narrow floodplain and fewer terraces. The high percentage of sites in the Lewis Creek watershed may reflect the relatively good documentation of sites in that area (for example, the Champlain Pipeline survey covered some of the watershed [Robinson et al. 1991, 1992]), as well as the presence of Bristol Pond (Lake Winona) and Monkton Pond (Cedar Lake) in that watershed. The Middlebury and New Haven River watersheds run through steep mountain terrain, and probably contain fewer sites than other watersheds.

If it is assumed that the Lower Otter/Dead Creek, Middle Otter and Lemon Fair watersheds should minimally contain the same site density as the better-surveyed Little Otter watershed, some estimates may be made of unrecorded sites. The Little Otter site density of 1.2/square mile was thus used to estimate unrecorded sites (Table II.7). At that density, lower Otter/Dead Creek would contain 124 sites, meaning that a minimum of 46 sites remain unrecorded. The middle Otter drainage would contain 96 sites, including a minimum of 57 unrecorded sites.

The Lemon Fair watershed appears to be the most dramatic case of an area with many unrecorded sites. The Lemon Fair is a favorite area for local collectors, who consider it to be among the richest collecting zones in the county. At the same density as the Little Otter watershed, there are at least 75 unrecorded sites in the Lemon Fair watershed. This estimate seems conservative, considering the wide floodplain, well-developed terraces and well-situated knolls of the Lemon Fair region. In just three Addison County watersheds, there is probably a minimum of 178 unrecorded prehistoric sites.

Perceived threat

Perceived threat is a somewhat different category than others discussed here. Threat to a site is estimated by its recorder (either professional or amateur) and thus represents an impression or perception. The "threat to a site" category in many cases may document a true, impending danger to a site. In other cases, the category may reflect the personal biases of the

recorder. For example, some collectors who record sites may not consider digging by collectors to be a site threat. Also, professional archaeologists vary in opinion on the issue of how much disturbance is caused to a site by standard agricultural practices. The category is useful, however, because it documents a general impression of what professionals and amateurs together believe to be the greatest dangers to Addison County sites.

Agricultural practices are by far considered to constitute the greatest perceived general threat to archaeological sites (Table II.8). This is not surprising, considering that the vast majority of county land and recorded sites are located in agricultural settings. The threat of agriculture to archaeological sites is, however, clearly overstated in the site files. Field observation suggests that if soil erosion is controlled in agricultural fields, standard plowing and farming is not a threat to intact subplowzone deposits. However, if erosion is present, or if extensive land levelling is done on uneven fields, subsequent plowing may disturb previously intact deposits. Despite this, it is important to note that if the alternative to farming is land subdivision and development, then farming threats to sites are minor indeed.

It is furthermore interesting to note that the percentage of sites threatened primarily by agriculture (49.5%) is far lower than the percentage of sites located in agricultural settings (77.3%). This reflects the unquestionable damage done to archaeological sites by vandalism (18.8%), development (13.9%) and erosion (10.0%). While some controls exist to protect archaeological sites from development (such as Vermont Act 250) and erosion (such as ripraps, and a general need to control it on farms), it is very noteworthy that vandalism (a largely uncontrolled danger) is the strong number two perceived threat to sites. Vandalism, the uncontrolled collecting and digging of sites for personal gain, is a major problem in Addison County. It is committed by people who are unaware of the destructive nature of their hobby, or worse, by people who are aware but who don't care. The "perceived threat" data for Addison County underscores the need for enforcement of state and national preservation laws and to explore methods for improving site protection outside of development projects (when they may be protected through regulatory means).

How do we separate the helpful and concerned collector from the destructive vandal? This is an important question for all people interested in archaeology, from the professional community to avocational archaeologists and collectors themselves. Briefly, good collectors limit themselves to surface collecting, number their artifacts and keep notes and maps on the sites where they collect. These people have been a great help in recording information for State Sites Inventory. In contrast, other collectors are buying, selling and trading uncataloged artifacts.

When this happens, scientific information is lost, and many remnants of Vermont's past leave the state forever. The worst of the collectors are the diggers, who are actively destroying sites. The diggers are our "thieves of time" and are stealing knowledge of the past from everyone.

Lastly, it is noteworthy that only 16 sites, or 5.2% of those recorded in the county, are considered to have no known threat. This is a graphic documentation of the extent to which Addison County's prehistoric sites are under siege. Even in this highly rural area, 94.8% of the known sites were considered by the recorder to be under threat of destruction!

Soil type

Recorded sites were sorted by soil type (United States Department of Agriculture 1971). Thomas and Doherty (1980:23-25) have presented a good discussion of Addison County soils which noted that a few major types such as Vergennes, Covington and Farmington have remained "fairly stable" for thousands of years. Stable soils are relatively unaffected by flood silting and other depositional processes, and are thus more likely to contain somewhat shallow sites of substantial antiquity.

The site file analysis revealed that more than twice as many sites are located on Vergennes Clay than on the next most important soil type, Covington. Vergennes Clay, a water-deposited lake bottom remnant, is the most common soil type in Addison County, covering 23.8% of the total area. However, because 39.4% of all known sites are located in Vergennes Clay, the concentration of sites represents more than an indicator of the commonality of the soil type.

In order to explore the relationship between soil type occurrence in Addison County and the presence of archaeological sites on a given soil, a "site probability coefficient" was constructed for each soil type with at least one recorded archaeological site (Table II.9). The percentage of sites in a given soil type was calculated, and the percentage of the county with that soil type was subtracted. A coefficient of zero thus means that the percentage of known sites on the soil type equals the percentage of the county in which the soil type occurs. Positive values mean that more sites are proportionally present on the soil type, while negative values indicate that the percentage of sites present is less than the soil type's occurrence. This system rates the proportion of sites to soil type without rewarding or penalizing a soil type for being either relatively common or rare.

The analysis results suggest that Vergennes Clay, the most common soil type, also has the highest proportional probability of containing sites. It is probably no coincidence that

Table II.9. Soil type, percent of county soils on that soil type, percent of county made up of that soil type, and site probability coefficients (scp) for each soil type, Addison County recorded sites.

soil type	# sites	percent	county %	scp
Vergennes	136	39.4%	23.8%	+15.6
Covington	60	17.4%	8.3%	+ 9.1
Livingston	24	7.0%	1.9%	+ 5.1
Raynham	24	7.0%	0.8%	+ 6.2
Farmington	19	5.5%	5.5%	0
Melrose	10	2.9%	0.9%	+ 2.0
Swanton	10	2.9%	1.2%	+ 1.7
Elmwood	9	2.6%	0.7%	+ 0.9
Limerick	8	2.3%	0.7%	+ 1.6
Colton	7	2.0%	2.1%	- 0.1
Hadley	6	1.7%	0.3%	+ 1.4
Nellis	6	1.7%	2.6%	- 0.9
Canandaigua	5	1.4%	0.2%	+ 1.2
Rock land	5	1.4%	4.1%	- 2.7
Salmon	5	1.4%	0.1%	+ 1.3
Winooski	5	1.4%	0.5%	+ 0.9
Muck and peat	4	1.2%	2.8%	- 1.6
Adams	2	0.6%	0.6%	0
Berkshire	1	0.3%	20.2%	-19.9
Cobbly alluvial land	1	0.3%	0.1%	+ 0.2
Stetson	1	0.3%	1.1%	- 0.8
Walpole	1	0.3%	0.0%	+ 0.3

Generalized soil types	# sites	percent
water-deposited Champlain Valley soils	308	89.8%
glacial till Champlain Valley soils	25	7.2%
Green Mountain/foothills soils	6	1.7%
other (Rock land, cobbly alluvial land)	6	1.7%

Vergennes Clay is a non-hydric soil that is often located near hydric soils. That is, Vergennes Clay drains easily and is often located near high resource zones such as swamps. It does not saturate with water like the hydric soils that are found in and around the swampier areas. Vergennes Clay thus is a logical soil for either temporary or permanent habitation, and was probably preferred to neighboring hydric soils.

Covington, Raynham and Livingston soils are three types that also have strongly positive site probability coefficients. Covington is a silty clay, Raynham is a silty loam and Livingston is a clay. All three are classified as hydric soils by the Soil Conservation Service. Covington and Livingston are very wet soils; Covington soils usually flood every spring. Both types drain very slowly. For this reason, sites on these soils would likely represent summer-fall seasonal occupations. Raynham silt loam is somewhat less moist than the other hydric soils. Where Covington, Raynham and Livingston are generally considered to be poor agricultural soils (United States Department of Agriculture 1971), Raynham soil drains by late spring. It is commonly used to grow alfalfa. Season of occupation by prehistoric people may have been less restricted on this hydric soil type.

One other soil type, Farmington stony silt loam, is also worth discussing briefly. Farmington is a non-hydric, very well-drained soil. Although its probability coefficient is zero, Farmington soil nevertheless contains the fifth highest number of sites (n=19). Sites on Farmington soil could well represent more established prehistoric occupations.

Sites in agricultural settings

The primary reason for modeling the prehistoric sites of Addison County is to protect both recorded and as yet unrecorded sites from the construction impacts of farm-related projects. It is thus useful to separately examine the 77.3% (n=218) of all known Addison County sites that are located in agricultural settings. To begin, it is not surprising that most smaller sites are found in agricultural settings, because plowed fields allow surface visibility that is not present elsewhere. For example 81.3% of sites in the 1001-5000 sq m range and 85.7% of sites in the 5001 to 10,000 sq m range are on farms. In comparison, only about 25% of the largest three site categories are found on farms. Larger sites are of course easier to locate regardless of surface visibility.

Drainage system affiliation figures also demonstrate the importance of sites on farms. Nearly two-thirds of all floodplain sites are on farms, along with 83.6% of all terrace sites. Even more unusual site types, such as upland sites (71.4%) are likely to be present in an agricultural setting. In most categories, the data for prehistoric sites on farms closely

parallel the total prehistoric site data.

High artifact frequency sites

Artifact frequency is one (though not the only) indicator of site significance. Site artifact frequency may be more accurate than site size in this regard, because small sites may contain the remains of a concentrated and significant special activity. High density sites (those with more than 500 artifacts reported) are likely to be considered significant regardless of their overall size. A brief examination of this site class allows us to discuss characteristics of the sites we are most concerned with preserving.

High artifact frequency sites are almost evenly divided between Archaic and Woodland components, including several with both. This is encouraging, in that it appears that artifact-rich sites of the entire cultural sequence (with the possible exception of the Paleoindian period) are present. High density sites tend to be higher in elevation than other sites: the mean elevation of 313 feet is 31 feet higher, and the modal elevation is 75 feet higher than that of all sites. Systematic research is necessary to determine whether this is a result of patterns of prehistoric settlement (a possibility discussed below) or differential site preservation. It is logical, however, that more permanent sites or revisited locations would be located on somewhat higher and drier land, while briefly utilized or special activity sites may be located on lower, moister territory.

High density sites are evenly distributed between watersheds. It is not readily apparent why watersheds like Lewis Creek would have as many high density sites as supposedly more important watersheds as Lower Otter/Dead Creek and Lake Champlain Direct. It is noteworthy that the Middle Otter Creek watershed, which ranks 5th among county watersheds with only 11% of all sites, contains as many high density sites as watersheds with many more total sites. Does this reflect the increased difficulty of locating smaller sites (and thus, differential site reporting)? Or do portions of the county contain greater percentages of certain site types and sizes indicative of prehistoric behavioral patterns? We can begin to explore this question later. It is again apparent that site recording in the Lemon Fair watershed has been relatively neglected. Informants report that the area contains numerous high density sites, yet only two such sites have been documented.

As a final note to this section, the perceived threat to high density sites is different than for all sites. By far (37.8%), vandalism is reported as the greatest threat. The fact that vandalism as a threat becomes more statistically prominent in high artifact density sites underscores the importance of public education and outreach efforts to curb archaeological site

looting.

Change through time in site patterns

A comparison of sites with earlier Archaic versus later Woodland components leads to some interesting observations (Appendices 2-3 and 2-4). Sites from both categories are widely distributed in several topographic settings, but there is an apparent trend of sites shifting from knolls during the Archaic to the floodplain during the Woodland period. A total of 26.9% of Archaic sites are located in floodplains, as compared to 33.0% of Woodland sites. While 25.2% of Archaic sites are on knolls (including the "swamp island" sites), only 14.9% of Woodland sites are situated on those primarily limestone rises.

A comparison of elevations supports the same trend. The mean elevation of Archaic sites (276 ft) is 27 feet higher than that of Woodland sites (249 ft). Median elevation, which may be a better indicator of site elevation, displays an even greater difference. The median elevation of Archaic sites (275 ft) is a full 85 feet higher than the median elevation of Woodland sites (190 ft). The hypothesized Woodland period shift toward the floodplains appears to have been accompanied by a shift toward the Lower Otter/Dead Creek and Lake Champlain shoreline areas. Those two watersheds together proportionally contain 17.2% more sites during the Woodland period than during the Archaic period. It is tempting to speculate that a hypothesized shift toward the floodplains and major river delta and lake shore area during the Woodland period was related to the increasing importance of cultivated plants. This is one of a number of important research topics to be potentially addressed in Addison County.

An Example of an Archaeological Sensitivity Model

In modeling site sensitivity, it is important to emphasize that site sensitivity models are very specific to the particular circumstances and characteristics of a region or sub-region. In Vermont, several approaches to site sensitivity have been taken, and professional archaeologists may disagree on the relative importance of individual variables. All sensitivity models, as reductions of complex, incompletely understood cultural and environmental patterns, will have their strengths and weaknesses. The model presented here was fairly effective for one county. It is presented as an example of how site file data may be distilled into a site location model. There is, of course, no substitute for on-the-ground field survey for sites.

In Addison County, a high percentage of as yet undiscovered sites (perhaps 75%) may be located by emphasizing a few key environmental attributes of recorded sites:

Landforms: floodplains, terraces, knolls are highly sensitive. Interior pond and lakeshores, and the Lake Champlain shore are also obviously sensitive, but these areas cover only a very small portion of the landscape.

Slope: under 8% slope is potentially sensitive.

Soil type: well-drained and non-hydric are more sensitive than hydric soils. Despite this, seasonal and short-term occupations may be on hydric soils. Non-hydric soils with hydric inclusions or with tendencies to be found near hydric soils are especially sensitive (Vergennes Clay is a classic example). Also, non-hydric soils can be expected to contain better preservation than hydric soils, and thus non-hydric soil sites may prove to be more significant.

Factors which may have been overemphasized: Distance from water seems to be a difficult factor to work with. If included in a model, even small springs and relict water should be included, but these are often not indicated on standard U.S.G.S. topographic maps. Should we measure distance from currently running water? from a swamp? The extensive flooding that seasonally occurs in lower-lying portions of Addison County alters distance from water for many areas. Many floodplain and terrace areas located several hundred meters from water contain sites. Also, a substantial number of sites are located on intermittent streams that are very far from water much of the time. Finally, the hydrology of Addison County has changed through time, because of various long-term and short-term factors (Thomas and Doherty 1980). Past water sources may no longer exist on the landscape.

A preliminary model combines the three most reliable determinants of site location: landform, slope and generalized soil characteristics (hydric or non-hydric). Figure II.4 represents the model and combines the three primary criteria into five sensitivity types, ranging from highest to low. About 75-80% of all Addison County sites will fall into highest and high sensitivity zones of Figure 2-4.

Advantages of this model: It is simple and easy to use. It discards the point system that can be cumbersome and open to the "fudge factor". This model also eliminates the subjective and difficult to measure "distance from water" factor.

Disadvantages: This model will add a large amount of land to the area presently considered to be high in archaeological sensitivity. The model may have a few inherent conflicts. For example, slope is one factor that produces different soil types, and certain landforms are often associated with particular soil types (producing some redundancy). Perhaps the major disadvantage is that it cannot find all sites, or guarantee that

Figure II.4. Sensitivity.

a site will not be encountered in a low sensitivity zone. Like all models, this one plays percentages and focuses on more typical sites and, hopefully, more significant sites. Certain significant prehistoric site types such as quarries, other special use sites, and burials will not be found through this or any model, but these site types are nonetheless present and scattered throughout the landscape.

Summary remarks

A preliminary model of archaeological site sensitivity in Addison County has been presented as an example, along with some of the data on which it is based. More complex models that incorporate more factors, perhaps including distance from water, may evolve from this. However, there is a sacrifice of simplicity and ease of implementation and use when factors are added into the equation. We may also add a relatively small percentage of sites to the pool of land considered to be of high sensitivity. If we are to consider some land to be high and other land much lower in archaeological sensitivity, we must necessarily exclude some land and sites. Perhaps a simple model geared toward identifying the densest sites will function better than a more-encompassing model that may contain subjective elements and be more difficult to use.

This model is not designed to replace the existing point-system models now used by the Vermont Division for Historic Preservation and consulting archaeologists across northern New England. Instead, it evaluates some of the many criteria used in those models, based on existing data. The model for Addison County may expose weaknesses (or at least unsubstantiated aspects) of the existing point-system model, but the new model is also designed to be utilized at a much more local level than the point system. It may thus be possible to utilize both models simultaneously, and with time, to empirically evaluate the relative practicality and accuracy of both.

Evaluation of the Archaeological Sensitivity Model

The 28 prehistoric sites recorded during the Archaeology on the Farms Project allow a preliminary assessment of the geographic attributes used in the model presented above. The three primary attributes, isolated from the site files of the Vermont Archaeological Inventory, are landform, slope, and general soil characteristics (hydryic versus non-hydryic soil). Also, an attribute of an existing site sensitivity model that was not used in this report's model is distance from water. A comparison of the attributes of recently recorded Addison County prehistoric sites with previously recorded site data reinforces the fact that models can only determine the location of a percentage of sites. The comparison also gives insight into possible biases in the recorded data, concerning what site types

tend to be recorded and what site types tend to remain unrecorded.

In terms of landform, 15 new sites (53.6%) are located on "Class 1 landforms," including floodplains, river terraces and knolls. The remaining 13 sites (46.4%) are located on "Class 2 landforms" such as uplands and hillsides. No new sites are located in Class 3 marshes and swamps. For land slope, 16 new sites (57.1%) are located on 0-3% slopes, 10 sites (35.7%) are on 3-8% slopes, and 2 sites (7.1%) are on 8-15% slopes. A total of 21 new sites (75%) are located on non-hydric soil types, while 3 sites (10.7%) are located on hydric soil, 2 sites (7.1%) are located on both hydric and non-hydric soil, and soil data are unclear for 2 sites.

Discussion

The newly-recorded sites of this project highlight both the advantages and problems of using generalized prehistoric site sensitivity models. On the positive side, general soil characteristics appear to be a strong indicator of site sensitivity, with 75% of new sites being located on non-hydric soil types, and with few sites (3, 10.7%) being found on a hydric soil type. Because hydric soils cover much of Addison County, this attribute will be important to the further development and refinement of any archaeological sensitivity models in Vermont. Slope also appears to be a fairly good indicator of site presence, despite a substantial number of new sites (42.8%) on slopes greater than 3%.

On the negative side, landform was a less specific indicator than anticipated of newly-recorded site locations. Only 15 sites (53.6%) are located on Class 1 landforms (floodplains, river terraces, and knolls), where most prehistoric sites were expected to be found. A substantial number of sites (13, 46.4%) are located on upland and hillside settings that are usually considered to have low archaeological sensitivity. Perhaps most surprising is the unexpected number of sites (13, 46.4%) located far from water. Some of these sites are near wet spots which might have been springs or small ponds in the past, and some are near gullies that might have held intermittent streams. However, several newly-found sites are located far from any possible water source.

Above all, the locational patterns suggest that certain biases exist in the Vermont Archaeological Inventory. The Inventory reflects the site recorders, such as amateur collectors, who have contributed important information to the state. For instance, many large floodplain and terrace sites near major rivers have been documented because these sites are conspicuous or are particularly interesting to artifact

collectors who report sites. These locations and landforms are thus correctly thought to have high archaeological sensitivity, but as a consequence, other areas are perhaps incorrectly downgraded in sensitivity.

In contrast, the newly-recorded prehistoric sites found during this project include relatively lesser-known site types that are of lesser interest to collectors. Two such prehistoric site types, quarries and small isolated homesteads, were repeatedly encountered in Addison County during the project. These site types are often found in areas characterized by any sensitivity model as low in archaeological potential. Non-residential sites such as quarries, for instance, do not require a water source. These site types usually do not contain a wealth of finished lithic artifacts that collectors prize (and thus, collectors who donate site information to VDHP may not find or record them as often as other site types). Nevertheless, these sites contain extremely important information on prehistoric industrial activities and settlement patterns.

While archaeological sensitivity models can help define areas where sites are most likely to be found, there is the danger that exclusive use of any model will reinforce existing preconceptions concerning sites and their locations. An overdependence on a sensitivity model can thus prevent important site types that tend to be located away from "prime areas" from being located. Despite their limitations, these models can successfully identify some of the most archaeologically sensitive areas of the basin. The sensitivity model presented above described most of the new site locations as highly sensitive. However, all sensitivity models are designed to find only a percentage of sites, and to allow a preliminary assessment of an individual land plot. This exercise shows that any such model must be used carefully with a realization of its limits.

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Appendix 1. Further Examples of Public Outreach to Local Organizations

Lewis Creek Conservation Committee

The Lewis Creek Conservation Committee (LCCC) represents the largest organized conservation group of landowners in Addison County. The Lewis Creek watershed is archeologically significant for its string of Late Woodland settlements. The upper portion of the watershed contains two ponds which have large multicomponent sites because of their long-stable shorelines. The LCCC is thus an important organization and forum for promoting CR protection in the county.

The organization holds several public outreach events each year. One of their largest events, the Sam Lovell expedition, usually explores the plant and animal wildlife of Lewis Creek in the field. For one expedition, this was changed to archaeological sites. A group of 40 persons trekked through the floodplain grasses to visit two small sites and discuss the county prehistory and general protection issues. This forum offered a chance to present archeology as a preservation issue related to water, soil, trees, and wildlife problems. The size of the group, much larger than the usual or expected turnout, demonstrated the popularity of archeology and the desire of the Addison County public to learn about prehistory. Organizations such as the LCCC are crucial for spreading concern and support for cultural resources into the environmentalist segments of the general population.

Friends of Kingsland Bay

Friends of Kingsland Bay (FKB) is a committee and organization dedicated to the responsible development of a lakeside park in the northern portion of Addison County. Part of the park was privately and town-owned for many years, but a transfer to state control is underway. One committee member teaches a 5th and 6th grade class I visited, and she asked me to sit in on some meetings.

The state park land contains at least one important prehistoric site, along with several important historic buildings and foundations. Part of the park had been archeologically surveyed for a proposed fish hatchery, which was later relocated to another county, and thus, good documentation exists for the prehistoric site.

At the meeting, I reiterated the report conclusions concerning the prehistoric site's significance. As the meeting progressed, discussion turned to using the cultural and natural

history of the park as a theme for its development, utilizing displays and exhibits in the park building. It was also agreed to set aside the prehistoric site in permanent sod as part of any development plan. My presence served to direct the committee's attention to the Division for Historic Preservation in Montpelier, hopefully encouraging direct communication as plans progress. I was also able to emphasize the importance of the park's cultural resources in the capacity of technical advisor. In this manner, the protection of a lakeshore site, a prehistoric site type that is rapidly disappearing due to development, was highlighted and reinforced, and the use of culture history as an educational and recreational resource for public benefit was encouraged.

Chimney Point Museum

The Vermont Division for Historic Preservation-owned Chimney Point Museum in the town of Addison is housed in a late 1780s-early 1790s house on the shore of Lake Champlain. The small museum houses excellent exhibits on the prehistoric, French, and British occupations of western Addison County. The museum lies within a large mosaic of archeological sites, both prehistoric and historic, and the museum contains some related collections, both professionally excavated and donated by amateur collectors. The state-owned field adjacent to the museum contains some of the most significant deposits.

The Archeology on the Farms Project conducted several activities in cooperation with the museum. Audrey Porsche, museum director, helped with SCS Conservation Field Days and has been a consultant to this project. I, in turn, helped supervise a museum volunteer in sorting and documenting a donated museum collection of prehistoric artifacts. In performing my public outreach, Chimney Point artifacts, slides of the exhibits, as well as the museum and grounds, were well-utilized, and it is hoped that these activities will generate greater community interest in the museum. Most significant for this project, however, was the controlled surface collection that was conducted adjacent to the museum, and the recommendations for improved management and transfer of land ownership between state agencies.

Data on the Chimney Point archeological and historic sites, and the controlled surface collection report are on file at the Vermont Division for Historic Preservation in Montpelier and at the Chimney Point Museum. Several comments may be made on the surface collection data recovered during this project. Despite having been picked over by collectors for untold years, the Chimney Point field still contains numerous diagnostic and semi-diagnostic artifacts of scientific interest. (Diagnostic artifacts are important in helping to date the site and interpret site functions and activities.) These artifacts will continue to surface as long as the field remains in agricultural use, which

consists of multiple episodes of plowing, harrowing, and leveling.

The presence of both broad and extremely localized concentrations of artifacts, plus the presence of reddened earth areas, suggest that intact sub-plowzone prehistoric remains are present in the field. These sub-plowzone remains could take the form of fire hearths, house floors, and activity areas, the last of which is measurable by spatial analyses of artifacts. The presence of reddened areas in newly plowed soil suggests that repeated plowing, harrowing, and leveling erodes the field, and subsequent plowing disturbs previously intact archeological remains. That is, because of the field slope, the plowzone is dynamic, and this significant site is thus damaged by standard agricultural practices. In contrast, historic artifacts appear to be incidentally distributed. In short, the presence of prehistoric artifact clusters in the plowzone hints at substantial prehistoric research potential for controlled excavation, if the site can be protected.

The results of the controlled surface collection suggest that plowing of this state-owned land parcel should stop. Artifact clusters and reddened soil areas suggest that previously intact sub-plowzone features were disturbed by the most recent plowing. The Chimney Point site complex appears to be one of the most significant archeological sites in Addison County, and as one of the most concentrated artifact scatters of the site complex, the field adjacent to the museum requires improved management.

Future plowing, harrowing, and leveling will further disturb intact deposits, and this should be avoided. Ideally, the field should be transferred by the Department of Fish and Wildlife to the Division for Historic Preservation and left in permanent sod, until the day when sufficient funds and infrastructure are present to conduct careful, controlled research.

Rokeby Museum

The Rokeby Museum is a small private museum in Ferrisburg in northern Addison County. It is located at the former home and farm of Rowland Robinson, a 19th century farmer, writer and country philosopher. The house contains period furnishings and an archive of Robinson manuscripts and drawings. The Rokeby Museum was helpful for its archival drawings of Merino Sheep washing during the Farm #62 case study, and was a co-sponsor with the Lewis Creek Conservation Committee of the Sam Lovell Expedition.

As the Rokeby Museum ponders its future, there are plans for expanded parking facilities. To help out this small, non-profit museum, I surveyed some proposed parking lot areas and estimated

the depth and quality of historic archeological midden deposits on the museum grounds. As a result, the parking lot was slightly moved and redesigned to avoid a particularly intact and rich area of deposits located by shovel testing.

In this case, the local presence of a professional archeologist allowed help to be given to a small museum to evaluate and protect one of its resources. I was able to emphasize the importance of archeological deposits and make museum personnel, who are more used to dealing with collections and standing historic structures, aware of the potential scientific contributions of the midden to the museum. There were discussions of initiating archeological research in some of the midden zones.

Sheldon Museum

The Sheldon Museum is a large house with extensive, carefully maintained archives in Middlebury. The Sheldon Museum is a major center of historic exhibits, museum education through volunteers, and archival research. It is thus one primary social focus of Addison County. The archives were indispensable to the development of the project's historic site case studies, including Farms #16 and #62.

The museum twice provided a forum for public presentation of the Archeology on the Farms Project. First, the goals, hopes, and aspirations of the project were presented early in the project. At the project's conclusion, the results, case studies and recommendations were presented. The audiences drawn to these talks also reinforced the strong support for cultural resource protection and the great hopes of Addison County citizens for future professional archeological research.

