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Authors

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HISTORICAL/ARCHAEOLOGICAL IMPACT STUDY

PREFACE

On October 1, 1977, the responsibility for marketing federally generated power was transferred from the Department of the Interior to the newly formed Department of Energy. The power transmission portions of the Dickey-Lincoln School Lakes Project were included in that transfer.

The U.S. Departments of the Interior and Energy have conducted system planning, location, and environmental studies for the transmission facilities required for the Dickey-Lincoln School Hydroelectric Project. These studies of many alternate routes have resulted in identification of a proposed transmission line route, and an environmental impact statement, as required by the National Environmental Policy Act of 1969. This report, one of several prepared under contract to the DOE by various consultants, is published as an appendix to that statement.

Appendix J, Historical/Archaeological Impact Study (two volumes, the second being a map volume), documents a study performed by the Anthropology Department of the State University of New York (SUNY), Binghamton, New York. The contract for this work was awarded in April 1977. At that time, the Department had completed system planning and regional corridor studies, and identified a system of alternative transmission line routes, substations, and microwave additions (delineated on the map inserted in this report). The contractor's responsibility was to assess and report the impact of these facilities on historic and archaeological resources. A reconnaissance level cultural resource survey was conducted. This is the first of three levels required under the National Historic Preservation Act. The Department is committed to the other levels (intensive site survey and protection - mitigation measures) prior to construction if the project is built. SUNY's effort included field observations, as well as collection and evaluation of existing data.

The State University of New York was selected to perform this study through a comprehensive, competitive evaluation process which considered, among other factors, past performance on similar studies, technical qualifications, management capabilities and familiarity with the Northern New England region. SUNY was found to possess excellent qualifications in all respects.

Harry D. Hurless
Project Manager
DICKEY/LINCOLN SCHOOL TRANSMISSION EIS.

HISTORIC, ARCHAEOLOGICAL AND RELATED CULTURAL RESOURCES STUDY

By

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Bruce R. Donaldson
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Paul A. Robinson
Edwin A. Hession
Judith A. Rasson

Submitted to the U.S. Department of the Interior
Dickey/Lincoln Environmental Impact Studies

By

Public Archaeology Facility
Department of Anthropology
State University of New York
Binghamton, New York 13901
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EXECUTIVE SUMMARY

This report summarizes the results of a reconnaissance stage (or Phase I) cultural resources survey of planned facilities and alternate transmission line routes in support of the Dickey/Lincoln School Transmission Lines Environmental Impact Statement. It is the first stage in the planning process designed to predict the impact potential, to recommend further steps toward mitigating such impact and to allow a general statement of preference of facilities location from those alternates considered, with the objective of minimizing the primary and secondary impact on historical and archaeological resources.

From the beginning of this project, the Department of the Interior affirmed its commitment to further studies of the right of way, when selected, including "site examination" on a case-specific basis and appropriate mitigation. They also indicated their intent to follow the letter and spirit of historic preservation rules and procedures, indicating a preference for resource preservation by avoidance and redesign of facilities as primary mitigation measures. As our recommendations will demonstrate, we concur with their intent.

Generally, we considered cultural resources at three scales of analysis: the region; the district; and the site. Of these, the region is the most difficult to characterize and to evaluate, in part because so little attention has been paid to cultural resources at this scale. Within the general project area, resources were of three general types: standing structures; cemeteries; and archaeological sites (both prehistoric and historic). Our study area included all alternate routes and facilities locations, routes being one half mile (one quarter
mile either side of the center alignment) as depicted on route maps provided by the Department of the Interior assessment team. This study universe comprised 770 miles of transmission line alternate routes, and eight microwave tower and six substation locations.

Methods

Our study methods were a combination of field observations and background data collection. Research techniques varied, depending upon the nature of the resource being investigated and the data source. For standing structures and cemeteries, we initially examined the one half mile route on the USGS quadrangle maps and on the aerial photographs supplied by the Department of the Interior. Generally, this was sufficient to give our field parties an initial approximation of potential impact and to guide their field assessments. This was followed by field observation of all road crossings of major highways and paved local roads, plus selected others as indicated by map and aerial photo examination. All structures within one quarter mile of such intersections were observed and those of an apparent age greater than fifty years were photographed. Our historic background team consulted libraries, archives and informants along the proposed routes, obtaining both published and unpublished references and information regarding local history and structures. Results of these studies are included in the narrative analysis of the existing environment, while details of information sources and contacts are generally confined to the appendices.

Archaeological resources, both historic and prehistoric, were more difficult to assess, especially given their extremely low visibility in this region. We
expected that significant historical archaeological sites would be revealed by
general background research and informant interviews, and found this to be the
case. Our background research for archaeological resources included the state
historic preservation offices, state surveys of historic resources and archi-
tecture, principal informants, local historical societies; as well as archives,
museums and libraries. From a survey of the literature on site locations in the
eastern woodlands and from an assessment of ethnographic data on the later
prehistoric and historic land use patterns in northern New England, we devised a
set of general environmental variables which were presumed to be necessary (but
not sufficient) conditions for past human land use, archaeological site locations.
At a scale of analysis appropriate to this study, these variables included prox-
imity to water, drainage rank and general elevation. In general, archaeological
sites from the prehistoric period have been found near water, on larger drainages
and at lower elevations. Since it is neither feasible nor required that all alter-
nate facilities locations be intensively surveyed at this stage in the planning
process, (as in a "clearance" survey) we devised a sampling strategy which would
provide evenness of coverage and representativeness sufficient to allow us to
extrapolate from the intensively surveyed sample to the study area. Our sampling
frame was structured to provide an interval cluster sample survey approximately
every 28 miles along the string of alternative routes. Each \( \frac{1}{2} \)-mile segment of
the route was evaluated for the three environmental variables to be considered and
scores were assigned. The distribution of combinations of variables scores was
compiled for the entire study universe and the 26 one-half mile sections were
selected and their variables combinations determined. Starting with the northern
end of the line, adjacent ¼ mile sections were added to those so that the final sample was statistically indistinguishable from the study universe in terms of these variables combinations. These 1½ mile "quadrats" were intensively field surveyed along the centerline. Explicitly, we were testing the model derived above and expected that we would find more sites in areas predicted by the model than in other areas of lower variables scores. However, we also expected a generally low site density in the area, with certain exceptions, and expected that there might not be sufficient sites located to provide an adequate test of the model. We conducted the field work from west to east, surveying all right of way centerlines of the 1½ mile quadrats selected. On our return westward pass along the routes, we selected a "grab" or judgement sample of 14 "likely looking locations" (such as major stream or valley crossings, terrace edges, etc.). Methodological details are covered in Chapter II.

Results

At the regional level, the portions of all three states through which the line passes have been subject to natural resource exploitation, rural and occasional urban development and other utilities facilities construction. As regions, they do not contain unusually significant cultural resources of sufficient integrity at this level of analysis to warrant detailed evaluation.

At the district level of analysis, the district in the Town of Peacham, Vermont, is of sufficiently significant content and integrity to warrant planning consideration as an outstanding example of a rural Vermont village with standing functional properties dating from the late eighteenth and early nineteenth
centuries. There are other areas containing properties of possible historic significance, but they appear to lack the content, integrity and uniqueness which make the Peacham area noteworthy. However, areas in this second category include Whitefield, New Hampshire, and Plainfield, Richmond, and Williston, Vermont. No locales of sufficient density and character of archaeological sites were discovered to warrant discussion at the scale of district.

At the scale of site analysis, we approach the data as point-specific standing structures and archaeological sites. Most of the cultural resources considered in this study are evaluated at this scale of analysis. Our field survey samples revealed no previously undiscovered archaeological sites within ¼ mile of the planned facilities. Several sites were discovered in the vicinity of the lines but, in general, known archaeological sites are few in the project area.

It is apparent that design and route constraints have combined to locate these facilities in areas of low archaeological site density. However, very little is known of the archaeology of this area, so any sites discovered would be of significance. From this research, there are two areas of outstanding archaeological concern, the crossings of the Connecticut River and the crossings of the Bailey-Hazen Military Road, both in Vermont.

No standing structures need be impacted directly by this proposed construction, thus our concern for historically significant standing structures is with the intrusive effect of facilities construction (what may be called indirect impact). The close proximity of the right of way to Peacham and its late eighteenth century tavern is an outstanding example of this impact potential on standing structures. Other areas with potentially significant structures lie
mostly in Vermont along the Winooski River (Williston and Plainfield, Peacham and Guildhall) and at Whitefield, New Hampshire. We provided our information on the ½ mile route to Comitta Frederick Associates, who added it to their data from the larger area from which the transmission facilities could be viewed (the "viewshed"). These data were considered as part of their larger study of visual and aesthetic impact.

With the exceptions noted above, there were no resources discovered which would be of such significance that mitigation would be impossible at this stage in the planning process. At a general level, necessary when entire lengths of alternate sections are being compared, it was extremely difficult to make meaningful distinctions between potential impacts of alternates. This was due to the relatively low density of known cultural resources and to the relatively similar settings on which the facilities were to be located. In Maine, there apparently will be rather little overall impact on existing cultural resources, as few are known. In New Hampshire, we were concerned with the Connecticut River crossing and those standing structures of historic potential along the right-of-way. Vermont contains more standing structures to be evaluated, the Connecticut River flood plain, the Peacham district and the Bailey-Hazen Road with its associated sites and structures.

Recommendations

1. We recommend a full and intensive archaeological survey of the final right of way and facilities locations. In spite of (or perhaps because of) the overall low density of both historic and prehistoric archaeological sites in
this region, they will be of rare and unusual character and will therefore be significant to our understanding of the region's land use history.

2. We recommend a full and intensive evaluation of standing structures within the viewshed of the completed facilities. The point specific mitigation of intrusive impact on significant structures should be made on the basis of a site-by-site evaluation of the viewshed. Determinations of eligibility of individual structures and districts to the National Register of Historic Places should be made, and the potential impact on these sites given careful scrutiny in accordance with existing federal regulations and procedures.

The overall policy of mitigation by resource location, avoidance and facilities redesign applies most importantly to archaeological sites and to those structures determined to be historically significant by the final right of way and viewshed survey and evaluation. If the lines or facilities may not easily be relocated, then an evaluation should be made of the cost-benefit ratio for archaeological excavation or movement of the affected structure. Given our present rate of knowledge of this area, excavation would probably be an acceptable mitigation strategy if it were cost-effective. Avoidance is always preferred where feasible, given other design and environmental constraints.

3. There is a significant historic district potentially eligible to the National Register of Historic Places in the town of Peacham, Vermont. Present design on that alternate would create major intrusive impact on that district. We recommend that this area be avoided by redesign and that other alternates be chosen if redesign is not feasible.
4. We recommend that future studies and survey continue to test and develop predictive models for sites in this region. Because very little prior work has been conducted and because our work has demonstrated low overall site density, it would be unwise to use an untested predictive model to stratify the right of way or facilities locations. While it would appear to be cost-effective to apply such a model without testing (thus reducing the amounts of area to be intensively surveyed), the results would be based on false premises and untested models. To test such a model, as could be done in an intensive survey, it will be necessary to treat the entire right of way as homogeneous for subsurface testing purposes, allowing the testing of predictions based on other data. With the reduced size of the project universe under study, it should be possible to utilize a finer scale of analysis and depiction and an accompanying finer resolution of detail in environmental variables. In this manner, subsequent studies will continue to contribute to our knowledge of the region while protecting its cultural resources from undue impact.
I. INTRODUCTION

A. BACKGROUND AND SCOPE OF WORK

The Dickey/Lincoln School Project consists of two distinct engineering and environmental studies. The first, the Lakes Project, falls within the purview of the U.S. Army Corps of Engineers (USCE), and is concerned with the construction of hydroelectric dams on the St. John River in the vicinity of Dickey and Lincoln School in the northernmost portion of the state of Maine. Survey and assessment of cultural resources in the construction and impoundment areas were undertaken in 1976 by Dr. David Sanger of the University of Maine (Sanger 1977).

The second set of studies is the Transmission Project. The U.S. Department of Interior (USDI) is responsible for marketing and transmission of electrical generation produced at Federal hydroelectric projects, and has the responsibility for the Transmission Project engineering and environmental studies. The following report was prepared under a USDI contract awarded to the State University of New York (SUNY) Research Foundation on behalf of the Public Archaeology Facility, Department of Anthropology, State University of New York at Binghamton. The report contains the results of a Phase I survey for cultural resources within the Transmission Project study area.

1. Project Location and Description

A double-circuit 345-Kv transmission line is proposed between Dickey Dam and the Moore Substation which is located near Moore Dam on the Connecticut River in New Hampshire. This portion of the line will be located near the divide between the St. John and Allagash River drainages and will parallel approximately the international border to the vicinity of Groveton, New Hampshire. From
Groveton, the proposed line will parallel the Connecticut River to Moore. From Moore a single-circuit 345-kV line is proposed to run to the Granite Substation, located approximately five miles south of Barre, Vermont, and from Granite the line will run northwestward through the Winooski River basin to a substation near Essex, Vermont. Finally, a 138-kV line is proposed from Dickey to Lincoln School thence to the Fish River Substation near Fort Kent, Maine (Figure 1). For study purposes the Dickey-Moore portion is broken in the vicinity of Jackman, Maine where a substation will be constructed either at Jackman or at a Moose River location. In addition, a study of eight substations and six microwave facility sites was required.

The routing of the proposed line between pairs of substation locations consists of a number of alternatives (Figure 1). Sets of alternatives between substation pairs are referred to as "route segments" and given letter designations: the line portion between Dickey and Fish River is Segment A; Dickey to Jackman or Moose River is Segment B; Jackman/Moose River to Moore is Segment C; Moore to Granite is Segment D; and Granite to Essex, Segment E. The basic unit of this network, a "link", connects two points within a given segment. Links are given number designations (sometimes with a letter appended, e.g., Link 17A). Numbers increase in the direction of power flow, that is, generally, from north to south and east to west. Links joined together within a segment form a "route alternative" and are labeled alphanumerically; for example, A-1 designates the first route alternative in Segment A. Within a route, the project engineers occasionally have given themselves minor options between or among links in the form of "localized routing alternatives" (LRA). These alternates are labeled with Roman and Arabic numerals, e.g., II-1.
Dickey / Lincoln Transmission - E.I.S. Project
Transmission Corridor Assessment
Transmission Corridor Area with Links and Major Link Numbers Marked
The above introduces some of the terminology that will be used; a fuller understanding, through both word and picture, will be given in Chapter III. The point we wish to make here is that our primary concern is to assess cultural resources along a number of alternative routes within the study area and to recommend a routing of least potential impact. In making this assessment, the link is our primary unit of analysis.

The link, for our purposes, is one-half mile in width. Thus our primary study area consists of 72 links totaling some 770 miles in length by one-half mile in width. In addition, because of the potential visual impact that the constructed transmission line may impose on historic standing structures, we have considered known cultural resources up to three miles distant from the corridor and have referred our data to Comitta Frederick Associates for visual impact evaluation.

2. Contract Requirements

General requirements have been provided in the Request for Proposals No. 7009 (1977):

"The contractor shall collect, map, and analyze resource data to determine (potential) environmental impacts resulting from construction, maintenance, or operation of the transmission facilities. Impacts shall be presented in quantitative and qualitative terms. The contractor shall also determine and suggest impact mitigation. The contractor shall recommend a least impact route (RFP7009:Unit 3:p.2)."

Requirements specific to an "Historic, Archaeological, and related Cultural Resources study" are included in RFP7009:

1. The identification of, and assessment of potential impact on, cultural resources shall utilize procedures similar to those described for a reconnaissance survey as defined in the USDI document entitled, "Guidelines for the location and identification of Historic Properties containing Scientific, Prehistoric, Historical, or Archaeological Data" (Appendix E).

a. Intensive Survey, also discussed in the above-referenced document, shall be conducted at a later date after selection of an exact and final right of way; it shall not be completed as part of this study.
2. The approach shall consist of two efforts:

a. The identification of known cultural resources in proximity to proposed facilities is to be made, utilizing sources of information including at least the National Register of Historic Places, state registers, and other such site files; state historic preservation officers and individuals affiliated with museums, academic institutions and historic societies, as well as other knowledgeable individuals; and published and unpublished sources of information on local or regional history, prehistory, ethnohistory and anthropology, and ecology.

b. A predictive analysis of the existence, occurrence, distribution, significance, potential impact, and possible mitigation of cultural resources in un-surveyed areas shall be made. This analysis shall be based on the relationships between human behavior (whether documented or inferrable) and features of the natural environment such as vegetation, slope, elevation, and proximity to water.

1) A field sample of typical environmental settings shall be collected to help improve and/or validate the predictive analysis.

3. A report shall be prepared describing existing historic, archaeological, and related cultural resources within the study area.

a. Based on proposed construction, operation, and maintenance methods, the potential impact on these cultural resources shall be assessed. Such impacts shall be described geographically and in qualitative and quantitative terms.

b. Alternative routes shall be comparatively discussed, evaluated, and ranked in terms of potential impacts.

c. Mitigation measures which would reduce impacts shall be discussed and geographically portrayed for all alternatives. Impacts which would occur and could not be mitigated shall also be identified.
B. THE PUBLIC ARCHAEOLOGY FACILITY

The Public Archaeology Facility (PAF) was organized as an applied research function of the Department of Anthropology, State University of New York at Binghamton, in response to the cultural resource management needs of communities, federal and state agencies, and construction and design firms in New York State and the Northeast. We operate field research programs in response to these needs and contribute to the intellectual development of cultural resource management policies. As a public educational institution, we combine training opportunities for our students with the development and refinement of efficient and effective methods and techniques for the location, assessment, and protection of our region's cultural heritage. We accomplish these functions in service to the public need through grants and contracts for applied research.

1. **Physical Plant**

The facility occupies over 5700 square feet of laboratory, office, and storage area that includes adequate space for processing artifactual materials and analyzing and storing collections. These labs include drafting equipment and materials, technical equipment for physical-chemical analysis of artifacts and field-collected samples, flotation apparatus, and site and map files which cover the Southern Tier of New York State in detail, with additional coverage for Northeastern United States. Our photographic darkroom possesses enlargers and other necessary equipment for photo processing.

2. **Field Equipment**

Our field equipment includes equipment that enables year-round operations in the Northeast. Equipment includes a Dig-R-Mobile power auger (6' x 12" dia.) and trailer.
In addition, we operate two heavy duty pick-up trucks (with four-wheel drive) and an 8-passenger van, and have regular access to five 12-15 passenger buses, a carryall, and various sedans and station wagons through the university motor pool.

3. Computer Facilities

The central facility consists of an IBM 370/158 computer, twelve IBM 3330 disk drives, two 3330 tape drives, a card/read punch, and two printers. The Computer Center also houses an off-line Calcomp plotter. Over 40 time-sharing terminals are available in several areas of the campus that provides PAF staff with convenient access to computing facilities.

Computer languages used include Fortran, Cobol, APL, PL/I, WATFIV, and Assembler. In addition, numerous canned programs and packages are accessible: BMD, SPSS, ORIRIS III, ESP, Calcomp (subroutines for plotting with the Calcomp plotter), and an extensive APL library.

4. Library Facilities

While the PAF has its own library of published and unpublished materials on our locale and on relevant research methods and techniques, its staff also uses the extensive collections of the University Libraries, regional libraries through interlibrary loan, personal libraries, and those of the Department of Anthropology. Through these facilities, we have library resources which cover relevant cultural resources in North America, and relevant methods and techniques.

5. Other University Services

The PAF has access to relevant university services, as needed in the scope of our field and laboratory operations. These include graphics, services and photographic services from the Department of Educational Communications, geological services (in soils analysis, petrology and pleistocene geology) from the Department of Geology, and osteometry and osteology within the Department
of Anthropology. Further, we have utilized the extensive expertise in regional history and architectural history available in the Department of History and the Roberson Museum in Binghamton.

Our facilities for manuscript preparation and publication include the university print shop, departmental secretaries and pool services, supplemented by commercial services in the Binghamton area. We have excellent copying and duplicating facilities, with access to apparatus for manuscript binding on a regular basis.

We utilize the fiscal services of the Research Foundation of State University of New York, with offices in Albany and on the Binghamton campus. They provide fiscal control and accounting services for our grants and contracts, following policies of the Research Foundation and the Board of Trustees of the State University of New York. Inasmuch as they act as our fiscal agent, formal contracts are negotiated and arranged through their offices.

6. Staff and Consultants

While our active staff fluctuates in response to specific program needs, we draw on the faculty of the Department of Anthropology and its students, as well as on consultants with relevant expertise from the Binghamton academic community. Their availability makes it possible to use their expertise to make efficient and effective use of a variety of services to fulfill our research programs. The PAF also relies on outside consultation, to provide broader scope and versatility, as relevant to particular cultural resource management problems.

For 1977-78, our potential staff includes:

Anthropology Department Faculty

A. Ammerman, Assistant Professor
   BA University of Michigan
   PhD London University
A. Dekin, Director, Public Archaeology Facility, Assistant Professor
   AB  Dartmouth College
   PhD  Michigan State University

J. Fritz, Assistant Professor
   BA  University of Chicago
   AM  University of Chicago
   PhD  University of Chicago

M. Fritz, Instructor
   BA  Mount Holyoke College
   MA  University of Chicago
   PhD  University of Chicago

W. Isbell, Assistant Professor
   BA  San Francisco State College
   PhD  University of Illinois

C. Redman, Associate Professor
   BA  Harvard University
   MA  University of Chicago
   PhD  University of Chicago

Advanced Graduate Students (Post MA, or equivalent in training and experience)

<table>
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<tr>
<th>Anthropology</th>
<th>History</th>
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<tbody>
<tr>
<td>D. Bailey</td>
<td>J. MacDonald</td>
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<tr>
<td>J. Bush</td>
<td>T. McCabe</td>
</tr>
<tr>
<td>B. Donaldson</td>
<td>J. Rasson</td>
</tr>
<tr>
<td>M. Fricke</td>
<td>P. Robinson</td>
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<td>E. Hession</td>
<td>P. Snethkamp</td>
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<td>P. Knobloch</td>
<td>N. Versaggi</td>
</tr>
<tr>
<td>J. Knoerl</td>
<td>J. Wanser</td>
</tr>
<tr>
<td>R. Holmes</td>
<td>R. McGuire</td>
</tr>
<tr>
<td>R. Holmes</td>
<td>J. Pepper</td>
</tr>
</tbody>
</table>

Professional Consultants may include:

R. Barons, historian
Roberson Museum, Binghamton, New York

M. Gimigliano, cultural geographer
St. Bonaventure University, Olean, New York

S. Jacobs, architectural historian
Cornell University, Ithaca, New York

M. Pratt, archaeologist
Ithaca College, Ithaca, New York
Further consultation and research facilities are available, as required, through the following institutions:

1. New York State Museum and Science Service, Albany, New York
2. New York State Division of Historic Preservation, Albany, New York
3. New York State Historical Association, Cooperstown, New York
4. Rochester Museum and Science Center, Rochester, New York
5. Syracuse University School of Forestry, Syracuse, New York
6. Roberson Museum, Binghamton, New York
7. Various local museums and historical societies throughout New York

7. Projects Summary: Applied Research 7/76-8/77

Table 1 below summarizes the contracts awarded to the SUNY Research Foundation on behalf of the Public Archaeology Facility over the past calendar year.

<table>
<thead>
<tr>
<th>Governmental Unit</th>
<th>Local</th>
<th>State</th>
<th>Federal</th>
<th>Total</th>
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<tr>
<td>No. of Awards</td>
<td>16</td>
<td>3</td>
<td>4</td>
<td>23</td>
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<td>$71,188.28</td>
<td>$293,887.81</td>
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</table>

Project locations have ranged from northern New England to southern Pennsylvania to western New York, but the bulk of our efforts have concentrated within seventy-five miles of the Binghamton campus. At the high point of this summer's field
season, PAF's workforce totaled 107 graduate and undergraduate students, engaged full time in the field, laboratory and office.

8. Professional Concerns

The practice of Cultural Resource Management is, by definition restricted in terms of pure research potential; public monies are spent for narrowly defined purposes within strictly delimited geographic areas. However, the underlying philosophy shared by PAF's project administrators is that the research potential offered by public projects should be viewed as opportunities for the development and testing of archaeological theory, method, and technique. These opportunities only increase the level of expertise and expand future capabilities. By becoming better archaeologists, we become better cultural resource managers and can undertake contracted projects more efficiently and effectively which ultimately results in a relative reduction in costs to those public agencies that employ us.

C. PROJECT PERSONNEL

While staff organization and composition may vary depending upon the individual PAF project, the research team assembled for the Dickey/Lincoln School Transmission Project is typical for our operations (Figure 2).

Dr. Albert A. Dekin, Jr., PAF Director, bears ultimate responsibility for all on-going projects and the development of proposals for future work. Since he also carries a full teaching load in the Department of Anthropology, his ability to become involved with any particular project is limited, hence a great deal of authority and responsibility is delegated to advanced graduate
FIG. 2

A. DEKIN
Principal Investigator

B. DONALDSON
Project Coordinator

J. PEPPER
Historian

E. HESSON
Field Director

SUPPORT STAFF
a) Administrative Assistant
b) Secretary
c) Draftsman
d) Photographer

FIELD CREW:
Five Graduate Archeologists

FIG. 2
students who serve as Project Coordinators. Professor Dekin has introduced explicit management practices and operation controls so that PAF and its employee-researchers work efficiently. He is consulted by Project Coordinators on an as-needed basis, but retains final approval on all proposals and reports that go out to contracting agencies, as well as on the in-house development of project research designs. His major interests include theoretical modeling methodology and application, and spatial behavior at the macro and micro levels. While his fourteen years of field experience include work in Alaska, the Northwest Territories, Nova Scotia and the Far West, he has gained the majority of his experience in the Northeast, especially in New York State.

Bruce Donaldson, Project Coordinator, bears primary responsibility for the development of the research and sampling designs, for day-to-day project operations, and for preliminary and final reports. Besides his interest in archaeological sampling, he is also concerned with the methods and analyses of prehistoric behavior at the regional and sub-regional levels. His doctoral dissertation, currently nearing completion, focuses on change in human adaptive systems over time and space. His seven years of field work have provided him with four full seasons of prior administrative experience. While he received his initial training in California and has been involved with resource management projects in New York, most of his field research has been carried out in Arizona. He will be leaving Binghamton in early autumn to accept an appointment with Arizona State University; he will serve as a full-time consultant for the U.S. Forest Service, exercising authority over the cultural resources of the Apache-Sitgreaves National Forest in east-central Arizona.
Jerold Lloyd Pepper is the Research Historian for the project. His primary responsibilities include the identification of historic cultural resources through literature and field survey, and the preparation of the historical overview of northern New England. He specializes in early modern American and European history with a particular interest in the impact of common people on social and political events leading to the American Revolution. His concern with methods of local history and historic archaeology adds needed breadth to the project team. Upon completion of the present project, he will begin full-time research on his doctoral dissertation in the Department of History.

Edwin Hession's job title of Field Director does not fully connote his contribution to the project. Aside from bearing primary responsibility for implementation of the research design, he was also involved in design formulation. Preparation of his Master's thesis on the prediction of site location in the upper Susquehanna River basin made him a valuable adjunct to the planning process. He gained his experience in the American Southwest as well as in the Northeast and much of his experience has been as Field or Project Director with cultural resource management projects. Having been selected as an intern by Interagency Archaeology Services (National Park Service), Ed will leave Binghamton this year to work in the IAS Eastern division headquarters in Atlanta, Georgia.

The field crew consisted of anthropology graduates. Paula Bienenfeld, William Mitchell, and Emlyn Myers have completed the first year of graduate study at SUNY-Binghamton; Stuart Eldridge will begin his second year of graduate work at the University of Pennsylvania; Guy Moura recently graduated from the University of Maine where he worked on the Dickey/Lincoln School Lakes Project for Dr. Sanger. Each individual was selected on the basis of his/her prior experience in the Northeast and interest in this particular project.
II. STUDY METHODS AND PROCEDURES

At one level of analysis cultural resources may be dichotomized on the basis of whether or not standing structures are present. Within the study area, the only sites containing standing structures are those belonging to the historic era. The term "historic" shall refer only to those cultural resources with extant architecture. The other type of cultural resource shall generally be referred to as "sub-surficial" or "archaeological" and such sites may belong to either the historic or prehistoric era.

The primary reason for making this qualitative distinction between cultural resource types has to do with a site's visibility, hence the ease with which it may be located and identified. The disparate visibility levels between historic and sub-surficial sites suggests qualitatively different approaches to their identification and evaluation. Sections of this chapter address different approaches used by the historian and by the archaeologists of our research team.

A. BACKGROUND STUDY: THE SHARED APPROACH

Preliminary research to identify known cultural resources differs between site types only to the degree that slightly different sources of information may be consulted. After familiarizing ourselves with literature pertaining to northern New England, the first step in data collection involved a check of the National Register of Historic Places (1977). This was followed by interviews in the offices of state historic preservation in Vermont, New Hampshire and Maine, and by examination of state survey files (Appendix D lists contacts). At this point research strategies diverged as the team began the field reconnaissance.
B. RECONNAISSANCE FOR HISTORIC RESOURCES

The research design for identifying historic resources followed a map-based approach. The geo-political units through which proposed routes would pass were identified from the base maps provided by USDI. These units include 11 counties. In addition, those population clusters (villages, towns, etc.) located within five miles of a proposed route were listed. Finally, the maps were used to identify 112 locations where a proposed route intersected a primary or secondary public thoroughfare ("road crossings").

The research historian's fieldwork involved two complementary efforts. The first was to contact individuals within the geo-politically defined study area who could provide knowledge of local history/prehistory and could identify possible sites. In addition to possible contacts provided by state and county offices, the historian found that town clerks, librarians, and postmasters were prime data sources for local information. This effort was complemented by the project coordinator and principal investigator who added to the bibliographic and site inventory data bases while pursuing other project goals. Additional data were provided by Comitta Frederick Associates, another project contractor.

The second effort involved a "windshield survey" of population clusters and road crossings to identify otherwise uninventoried sites of potential historical significance which might be impacted by the transmission line. To gauge potential significance, the historian used his assessment of the age of a structure as a minimal guideline. Formal assessment of a site's integrity, prior impact, or other criteria of National Register eligibility was not attempted. However,
significance-related observations about the site were noted. All photographs of structures were examined by Mr. Richard Barons, Curator, Roberson Center in Binghamton, for architectural type and approximate date (Appendix A). The level of effort for historical reconnaissance included six weeks of field time for the historian, during which he traveled in excess of 4,000 road miles, interviewed 47 informants and observed 112 road crossings.

C. RECONNAISSANCE FOR ARCHAEOLOGICAL RESOURCES

The essential research design was outlined in the Request for Proposals No. 7009 (1977) scope of work (Chapter I). To recapitulate, the RFP calls for two efforts. The first entails the identification of known cultural resources. The approach to this goal is not qualitatively different from methods described in Sections II. A. and II. B. The second effort calls for an analysis which explicitly requires the development of an ecological model to predict the probability of site location; the model is to be tested through a representative field sample.

1. Predictive Modeling and the Role of Probability Sampling

The past decade or so has shown an increasing trend in the use of modeling techniques in archaeology. This trend is part of a general shift from data-oriented research (the ultimate aim of which was the collection, description, and classification of artifacts) to problem-oriented research which attempts to explain the regularities of human behavior whereby the artifacts were manufactured, used, and deposited. A problem-oriented study is usually initiated with the definition of a research goal (the "problem") followed by the framing of a
hypothesis model which serves, on a preliminary basis, to account for observed
data and to predict the kinds of data which further research will discover.
Such models are most often based on general principles of human behavior and on
a priori knowledge particular to the research problem. The exact nature of any
given model depends upon the definition of research goals, the location and nature
of the archaeological population to which the research problem pertains, and
the extent and quality of a priori knowledge about that area and population.

It is generally the case that a researcher will lack sufficient time,
money, and ability to discover and deal with all the data in a chosen study
universe. In such an instance, the researcher is constrained to look at only a
portion of the potentially available data, and by extension, only a portion of
the universe. Broadly speaking, this problem may be resolved by two different
approaches: the researcher may opt to examine those portions of the study area
which would seem to be most productive in terms of data retrieval, in which case,
experience, expertise and judgment guide the research; alternatively, the
researcher may desire a sample of the universe which is representative of all
the data in that universe, in which case the research is guided by the methods
of probability sampling to ensure that the data are representative of some larger
reality.

We could contend that since all archaeological research involves sampling
of one form or another, the only acceptable approach to archaeological research
entails the explicit use of probability sampling. Not only is this in keeping
with contemporary professional expectations and standards, but for cultural
resource management projects such as the one considered here, the use of an
explicit sampling design is required so that the investigator, after examining only a portion of the universe, may report to the sponsor on all portions of the project area.

While an ad hoc "judgement sample" may produce more data, such data are qualitatively inferior within the context of regional research. If one is interested in predicting the distribution of cultural resources over space, the discovery of a site by judgement survey reveals nothing new about the possibility of locating other sites; knowledge gained is particularistic. In contrast, information provided by a site found in the course of a probabilistic survey can be extrapolated to other portions of the universe. This is so because "controls", usually in the form of environmental factors, are imposed over the universe during the design of the sampling strategy. The researcher then is able to calculate the probability of locating other sites in areas subject to those controls pertaining to the found site. Hence, through use of an explicitly probabilistic sampling design, one can evaluate within statable limits unexplored portions of a study area, an option otherwise not available.

The relationship between modeling and sampling is complementary. A model provides a coherent framework incorporating extant knowledge; it serves as a predictive device in that any new knowledge should conform to the "expectations" of the model; it is a heuristic device in that new knowledge may be incorporated into a refinement of the model, making it a closer approximation of reality.

The validity of a model must be demonstrated before it is accepted, and validation consists not only of finding sites (to continue the example) where one expects, but of not finding sites in less likely places. That is, even if
a model makes explicit its positive predictions, it also by implication, makes negative predictions. The sampling design is framed with regard to the model and is employed as a means of providing verification ("ground truth") for it. Properly constructed, the model requires the investigator to look at portions of all of those areas of the universe which the selected controls indicate to be qualitatively different, no matter what the expected relative probability of locating a site. A sampling approach that aims at anything less than thorough coverage is to be avoided, for otherwise it would be impossible to demonstrate the validity of the model. This last point is especially true in regard to judgement "samples": any critic would point out that the researcher is involved with self-fulfilling prophecies and should carry things to their logical conclusion by trading in one's trowel and compass for tea leaves and a crystal ball.

2. A Priori Knowledge

As approximations of reality, models depend to a great degree upon the extent and quality of a priori knowledge about that reality. Unfortunately, little is known about that portion of New England of concern here. Of that which is known, much consists of vague site location information that lacks any indication of temporal/cultural provenience. Much of this information apparently has been drawn from historic documents. Primary survey by professional archaeologists has been limited and mostly restricted to the Connecticut and lower Winooski River basins. However, by piecing together available information, a general outline of prehistory can be drawn (Appendix B).
The region surrounding the study area does not lack a respectable time depth. Fluted points and other artifacts associated with a Paleoindian occupation (ca. 8000-6000 B.C.) have been found in the Richelieu-Champlain-Hudson basins (Ritchie 1957, 1965; Funk 1972; Salwen 1975), in New Hampshire south of the White Mountains (Bolian 1976; Dincauze 1976), and in Maine and New Brunswick (MacDonald 1968). Population levels are low (Haynes 1966) and, based on the few known sites in the greater New England region, relatively concentrated in the major lake and river systems and along the coast. The people subsisted on hunted and gathered products, moving from area to area as seasons and the availability of resources cycled through their annual changes.

Although the Paleoindians exploited a periglacial environment, one in transition from the final stage of the Pleistocene "ice age" to an essentially modern one, the basic pattern of human exploitation for the region may well have been foreshadowed during this early period. The concentration of activities along major drainages and seasonal rounds that may have involved movement from littoral to interior are suggested by the later prehistoric record and are described by early European observers. It is not implied that aboriginal culture remained static through the millennia, rather that this basic economic pattern provided the context within which social forms were elaborated and technology became more specialized and efficient. Harp (1977:64) has suggested that even the adoption of horticulture did not alter the practice of seasonal movement. Population sizes, reflected in site numbers, show an increasing secular trend through time, but relative population densities probably did not reach the levels of adjacent lowland and coastal regions in the Northeast.
The study area, lacking much particular data, can be examined in light of the generalized, low-level model of the region's prehistory. The western portion of the universe, proximate to the main stems of the Connecticut and Winooski drainages, could be predicted to contain more sites than the eastern portion. Known historically to have been major avenues of aboriginal communication and transportation (Hucksoll 1967; Price 1967; USCE 1973), these drainages also would have provided a greater diversity and abundance of economic resources. The eastern portion, by contrast, is generally higher in altitude as well as latitude, offering little outside of fish, fowl and the larger fauna. Although transportation and communication routes traversed this area too, access is generally more difficult. In sum, it may be concluded that the western portion of the study universe was exploited more intensively, by more people, perhaps over a longer time span, and should contain more sites.

This summary review of prehistory is cast at a general level because it allows for easy extraction of those factors that most likely influenced the selection of site location; more depth and detail is not warranted for purposes here. Appendix B provides a more detailed account of the culture history. The preliminary model of prehistory will suffice because it is so general, and because the universe of interest is at the same time both narrowly defined and far-flung. To encompass and treat the study area as a unit demands the sacrifice of a certain amount of precision. Treating the area as two separable physiographic/cultural units, east and west, was considered, but rejected because that approach would result in added effort without a concomitant increase in precision.
3. Qualifications of the Study Area

A single operational decision will be interjected here so that the following discussion on environmental scoring will be fully understood. From an operational standpoint, we decided that the universe could best be dealt with as if it were a single long route excerpted from its geographic location. Accordingly, links were joined together, head to tail, in ordinal sequence. This resulted in a perceived universe one-half mile in width and 770 miles in length. The link divisions were maintained, but each link was subdivided into one-half mile segments along the route length which resulted in the definition of half-mile by half-mile quadrats. These quadrats became the basic units for environmental scoring and for field sampling. Their use for these purposes will be discussed below. It should be noted that the "linearization" of the universe causes no real impact on the data or analyses; the operation was performed simply to facilitate procedural activities.

4. The Model and the Methodology

What, then, are the factors influencing site location which are amenable to study, given this scale and degree of resolution which we are able to use? In the absence of cultural particulars, one must consider systemic relations between humans and their environment, an approach pioneered by Julian Steward (1955, 1977) and applied with success to archaeological problems (see e.g., Struever 1968; Gummerman 1970). Although the environment cannot be viewed as a determining agent, it does impose limitations on human behavior, resulting in perceived correlations between certain environmental factors and such behavior as site location (e.g., Jochim 1976; Hession n.d.). But, again, a priori
knowledge of some particulars is required: there are studies (e.g., Bennett 1969; Vogt and Albert 1970) which demonstrate the efficacy of pluralistic adaptations within a single ecosystem.

Of the three primary objectives for site location which Jochim (1976) defines, the first is proximity to economic resources. Based on our general knowledge of New England prehistory, the most critical factor would seem to be proximity to water. This variable correlates well with economic resource incidence, and, further, provided the only practical means of aboriginal access to most of the study area. Therefore, insofar as individuals passed through or exploited resources within the study area, we predict that the occurrence of such activities would have been in relatively close proximity to water features. The different types of activities that might have occurred at different types of water features (rivers, lakes, bogs, etc.) would have varied, but since our ability to model such variability is extremely limited (because of gaps in a priori knowledge) and since such a high level of resolution is not a project requirement, it is not deemed necessary to attempt to control variability at this scale. For our purposes, the general measure of proximity to water will suffice.

Economic resources, beyond the correlation with water features, form a set of important predictive variables. Since knowledge of prehistoric subsistence in the study area is limited, we would be in danger of making false assumptions if we attempted to predict site locations on the basis of the distributions of particular resources. Climatic factors and their seasonal patterns are effective determinants of the scheduling and availability of all
resources within the study area, so we might base assumptions about site locations on variables such as rainfall or temperature patterns, or both together. Rather than plot isotherms and isolynets, it has been found that elevation alone is a variable which adequately characterizes climatic patterns within a region, hence correlates well with seasonal patterns of flora and fauna. We predict that site location is a function of elevation. Given that populations in the area, in all probability, spent most of their time in lower elevation camps, we further predict that site location and density is an inverse function of elevation, that is, we predict that more and larger sites will be found at lower elevations than at higher.

Northern New England is a region of pronounced physiographic variability and such variability must have been an important consideration for site location. Proximity to water or elevation alone does not adequately encompass this variability, so we must derive another general index. A definition of landform types should give excellent control over the physiography; for instance, we could predict that sites would tend to be situated in well-drained, relatively flat locations, but rarely on steep, rocky slopes. After some consideration, it became apparent that landform variables were too numerous and too specific in terms of size and location to be used in a general model, although they are useful at a more specific, fine-grained level of investigation; it was decided that landform variables should be held in reserve until more information was available. One variable that has been used in other parts of the world for predicting prehistoric site locations is drainage-rank. Geologists and geographers have long used drainage-rank systems to characterize subdivisions
of regional areas. The usual method of ranking drainages is as follows
(Horton 1945; see Plog and Hill (1971) for the application in archaeology, and
also Weide and Weide (1973) who correct errors in Plog and Hill). Beginning
at the top of the drainage, all initial watercourses are given the rank of
one; where two or more rank-one watercourses conjoin, the watercourse below
that point is given the rank of two. In general, when two or more courses of
equal rank conjoin, the downstream segment is given one rank-order higher;
when two courses of unequal rank conjoin, the downstream course retains the
higher rank.

But what does drainage-rank have to do with physiographic variability?
It was reasoned as follows: A consideration of drainage-rank explicitly
demands the presence of water, i.e., the first variable; if one may consider
two variables in conjunction, then one might also consider all three variables
together. Generally speaking, the smaller the drainage-rank, the smaller the
watershed that is drained; size of watershed would be a factor in site loca-
tion because it would be an approximate measure of contained resource diversity,
hence resource availability. Drainage-rank would also influence other site-
location factors; for instance, in the general case the higher the rank, the
broader the drainage, the easier it would be for communication and interaction
between cooperating groups. Thus one can argue that drainage-rank is a variable
which figures into site location. When this is taken in conjunction with
elevation, moreover, a little thought will reveal that a low-rank, low-elevation
area should differ physiographically from a low-rank, high-elevation area.
Drainage-rank is, admittedly, a very rough measure of physiography, but it is
a useful summary variable to characterize this and other factors influencing
site location. Its general usefulness will become more apparent in the course of outlining the sampling design.

Among other variables we considered to structure the predictive model were ground-cover and landform slope and aspect. These data classes have been generated and mapped by USDI and were available for our use. Ground cover is a more direct indicator of economic resource distribution than elevation. Slope is a predictor of site location in that one would not expect to find sites on terrain with slope greater than 10%. Aspect refers to the cardinal direction that a landform faces. Slopes with southerly aspects receive more radiant energy than northerly-facing slopes, and probably were favored as locations for habitation sites. Although use of each of these variables would aid in model refinement, there arose particular technical problems in their application. The basic problem involved translating the data into summary variables at a scale compatible with our one-half mile-square quadrat; the resolution of these variables generally is much lower than the "grain-size" we found most suitable for this particular study. Any gain in information is countered by a loss in precision occasioned when these smaller-scale data are summarized. While these would be useful variables in other circumstances, the more general variables were deemed sufficient for our purposes.

Each of the variables that we used, i.e., proximity to water, drainage-rank, and elevation, was scored on the basis of variable-state, e.g., quadrats belonging to different elevation classes were scored differently (see below).

These scores are integer ranks, which raises a minor theoretical point. For example, low-elevation quadrats receive a rank-score of 3 while high
elevation units are scored 1; this could be understood as implying that low
elevation units are three times as likely to contain sites, but that is not
our intent. Our ability to make predictions is confined solely to making
relative statements of the form, "Quad (or link or route) n has a higher (or
lower) probability of containing sites than quad m," but not of the form "Quad
n is x times more likely to contain a site..." So, even though we may treat
these rank-scores as if they were continuous variables (not inappropriately,
because they can be viewed as rough estimators), the numbers must be considered
in the final analysis only as indicators of relative probabilities.

The following section provides a summary outline of the scoring procedure.

5. **Procedure for Assigning Environmental Scores**

   I. Phase One: Selection of sample quadrats

   A. Tactic 1: Stratification of universe-Level 1: Quadrat definition.

      1. ASSUMPTION: Variability within the width of the route is
         adequately characterized by conditions within one-half mile
         of the route centerline.

      2. ASSUMPTION: Variability along the route is adequately
         characterized within one-half mile of any given point on
         the centerline.

      3. TASK: Stratify universe into ½ mile x ½ mile discrete
         quadrats, each of which is bisected by the route centerline.

   B. Tactic 2: Stratification of the universe-Level 2: Quadrat
      characterization.

      1. ASSUMPTION: Frequency of human activity within the study
         area is a direct function of the availability and proximity
         of water.

      2. TASK: Score each quadrat:
         2 if water is available within subject quadrat;
         1 if water is available with adjacent quadrat;
         0 if water is not available within subject or adjacent
         quadrat.
3. ASSUMPTION: Frequency of human activity is a direct function of the rank of the drainage within which a given quadrat lies.

4. TASK: Score each quadrat:
   0 if previous score is 0 or 1;
   1 if drainage-rank is 1;
   2 if drainage-rank is 2;
   3 if drainage-rank is 3;
   4 if drainage-rank is 4 or greater.

5. ASSUMPTION: Frequency of human activity is an inverse function of elevation.

6. TASKS:
   a. Measure range of variability in elevation for the study area.
   b. Divide this range into three equal segments, characterizing relatively high, medium, and low ranges.
   c. Calculate quadrat provenience on the basis of: 
      \( \frac{(\text{within-quadrat high elevation} - \text{low elevation})}{2} \).
   d. Score each quadrat:
      1 if quadrat is within high range;
      2 if quadrat is within medium range;
      3 if quadrat is within low range.

7. TASK: Total scores for each quadrat on the basis of proximity to water, drainage-rank, and elevation range (Table 2).

   Table 2 indicates that each quadrat may receive a total of nine possible scores. The score possibilities may be assigned to probability classes indicating the relative likelihood of finding a site within a given quadrat; total scores 1-3 are in the low-probability class, 4-6 in the medium class, and 7-9 in the high-probability class. It should be noted that a slight bias has been built in to the scoring system in that there are more possible score combinations resulting in a total score that falls within the high-probability class (seven combinations) than within the medium class (six combinations), and...
TABLE 2
ENVIRONMENTAL SCORES FOR QUADRATS

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>SCORE PER QUADRAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proximity to water</td>
<td>0</td>
</tr>
<tr>
<td>Drainage-rank</td>
<td>0</td>
</tr>
<tr>
<td>Elevation Class</td>
<td>1 2 3 1 2 3 1 2 3</td>
</tr>
<tr>
<td>TOTAL Score</td>
<td>1 2 3 2 3 4 5 6 5 6 7 6 7 8 7 8 9</td>
</tr>
</tbody>
</table>

PROBABILITY
Class:
Low        x x x x x
Medium     x x x x x x x
High       x x x x x x x
more in each of these classes than in the low-probability class (five combinations). For the rationale behind consciously interjecting bias into the sampling design, we refer back to Section II.C.1 where we noted the necessity for sampling low-probability areas as well as the high-probability zones. This method of structuring score allocations will allow representative sampling to be accomplished on the basis of a systematic selection of sample units, while at the same time ensuring that proportionately more effort would be expended on surveying higher-probability areas, hence lowering the expected cost-benefit ratio. The same results could have been achieved by using an explicitly disproportionate sampling scheme (Redman 1974), but this method potentially could have created conflicts with our other sampling goals where reconciliation would have been difficult to achieve. This method of manipulating the data prior to structuring of the sampling design seemed to be the more efficient course to follow in this particular case.

6. The Sampling Design

There are three basic goals toward which any sampling design should aim: representativeness, coverage, and economy.

A representative sample for a regional study such as this requires that the totality of units sampled, measured by some criterion, reflects the totality of all sample units (the universe) when measured by the same criterion. In this case we will compare the environmental scores (the "criteria of measurement") of the sample with those for the universe.

Coverage refers to the dispersal of sample units throughout the universe. It is not a necessary goal for all archaeological samples, but is a
highly desireable one for cultural resource management projects (Donaldson 1977). For this study, even coverage was achieved through the systematic selection of primary sample units. A sample may have the quality of even coverage but may not be a representative one; the reverse situation may also be true. In order to reconcile these possibly-competing goals, some degree of flexibility was allowed in the selection of auxiliary sample units.

Economy refers to the amount of fieldwork that can be accomplished given constraints on time and personnel. The desire, again, is to decrease the cost-benefit ratio. The level of effort proposed for the archaeological reconnaissance consisted of six archaeologists for thirty field-days each. In planning, we allowed for four days of adverse weather which left 26 crew-days for field sampling. Knowing that each of the sample units would be some distance from the next and that many units would be in difficult terrain, we planned on the crew spending one day in each of the sample locations so that more working-hours would be spent in survey rather than in traveling between survey points. So for reasons of economy and logistics, we decided to survey two contiguous or "auxiliary" sample units in addition to the systematically selected primary unit. Thus each day would be devoted to survey of a 1.5-mile segment of the line. (All things considered, especially physical access to sample units in the North Maine woods, 1.5 miles seemed a not unreasonable goal for a crew-day's efforts; in retrospect, this estimate appears to be too conservative - we now feel that we almost could have doubled the number of sampled units, or length of the survey units, or struck some compromise between unit size and number of units that would have increased economy.)
With our basic goals identified, we turned to operational procedures, the first of which was the systematic selection of primary sample units. The sampling population consisted of 1386 units representing 693 miles of proposed route. (The discrepancy between this figure and the total route mileage of 770 is due to additions to the network made by USDI after we had completed much of our planning for the fieldwork, and also is due to deletion from consideration of certain links by us. In all cases the deleted links were relatively short and served only to interconnect portions of major alternative routes, hence their deletion should have little or no effect on our results. The number of primary sample units (26) was based on the number of available crew-days, so it was simply a matter of dividing this figure into the number of units in the population (1386) to determine the sample; \( \frac{1386}{26} = 53.3 \), so every fifty-third unit in our population would be sampled. The proportion of the population sampled is 0.0563 \( \frac{26 \text{ units} \times 3 \text{ units/sample}}{1386 \text{ units}} \). Considering the entire universe, the sampled proportion is 0.0506. \( \frac{26 \text{ units} \times 1.5 \text{ mi/unit}}{770 \text{ miles}} \).

At this point, having provided for even (systematic) coverage, we had to determine the representativeness of the primary sample. To do this we compared the distribution of total scores within the sample to the distribution of total scores within the universe as a whole. The comparison was made using the Chi-square statistic. The results of this test indicated that there was no significant difference between the primary sample and the parent population (Table 3, Sample P).
TABLE 3

COMPARISON OF SAMPLE WITH UNIVERSE FOR TOTAL ENVIRONMENTAL SCORES

Environmental Scores, Sample P

<table>
<thead>
<tr>
<th></th>
<th>1&amp;2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Scores in Universe:</td>
<td>162</td>
<td>167</td>
<td>296</td>
<td>258</td>
<td>209</td>
<td>129</td>
<td>69</td>
<td>96</td>
</tr>
<tr>
<td>Total Scores in Sample:</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

Results of test: Chi-square = 9.29* (d.f. = 7).
\[ p(U=S) = .2323 \]

* (NB: The computation violates one rule: when more than two categories are involved, i.e., df>2, not more than 20% of the expected values for the sample are < 5. Since violation of this rule tends to inflate the value of the statistic, we still have a good indication that the distributions are not dissimilar.)

Environmental Scores, Sample A1

<table>
<thead>
<tr>
<th></th>
<th>1&amp;2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Scores in Universe:</td>
<td>162</td>
<td>167</td>
<td>296</td>
<td>258</td>
<td>209</td>
<td>129</td>
<td>69</td>
<td>96</td>
</tr>
<tr>
<td>Total Scores in Sample:</td>
<td>4</td>
<td>9</td>
<td>11</td>
<td>12</td>
<td>12</td>
<td>10</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>

Results of test: Chi-square = 10.23 (d.f. = 7)
\[ p(U=S) = .1744 \]

Environmental Scores, Sample A2

<table>
<thead>
<tr>
<th></th>
<th>1&amp;2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Scores in Universe:</td>
<td>162</td>
<td>167</td>
<td>296</td>
<td>258</td>
<td>209</td>
<td>129</td>
<td>69</td>
<td>96</td>
</tr>
<tr>
<td>Total Scores in Sample:</td>
<td>6</td>
<td>10</td>
<td>15</td>
<td>13</td>
<td>13</td>
<td>10</td>
<td>7</td>
<td>4</td>
</tr>
</tbody>
</table>

Results of test: Chi-Square = 5.070 (d.f. = 7).
\[ p(U=S) = .6507 \]
<table>
<thead>
<tr>
<th>Observed</th>
<th>Expected</th>
<th>(1)-(2)</th>
<th>(3)x(3)/(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>162</td>
<td>158.34</td>
<td>3.66</td>
<td>.08</td>
</tr>
<tr>
<td>167</td>
<td>167.88</td>
<td>-.88</td>
<td>.005</td>
</tr>
<tr>
<td>296</td>
<td>292.84</td>
<td>3.16</td>
<td>.03</td>
</tr>
<tr>
<td>258</td>
<td>257.55</td>
<td>.45</td>
<td>.0008</td>
</tr>
<tr>
<td>209</td>
<td>210.81</td>
<td>-1.81</td>
<td>.02</td>
</tr>
<tr>
<td>129</td>
<td>132.59</td>
<td>-3.59</td>
<td>.1</td>
</tr>
<tr>
<td>69</td>
<td>72.50</td>
<td>-3.50</td>
<td>.17</td>
</tr>
<tr>
<td>96</td>
<td>93.48</td>
<td>2.52</td>
<td>.07</td>
</tr>
<tr>
<td>4</td>
<td>7.65</td>
<td>-3.65</td>
<td>1.75</td>
</tr>
<tr>
<td>9</td>
<td>8.12</td>
<td>.88</td>
<td>.1</td>
</tr>
<tr>
<td>11</td>
<td>14.16</td>
<td>-3.16</td>
<td>.7</td>
</tr>
<tr>
<td>12</td>
<td>12.45</td>
<td>-.45</td>
<td>.02</td>
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<tr>
<td>12</td>
<td>10.19</td>
<td>1.81</td>
<td>.32</td>
</tr>
<tr>
<td>10</td>
<td>6.41</td>
<td>3.59</td>
<td>2.01</td>
</tr>
<tr>
<td>7</td>
<td>3.50</td>
<td>3.50</td>
<td>3.49</td>
</tr>
<tr>
<td>2</td>
<td>4.52</td>
<td>-2.52</td>
<td>1.40</td>
</tr>
</tbody>
</table>
We next had to consider selection of the auxiliary sample units, i.e., the two contiguous units which, added to the primary unit, would bring the survey unit to its 1.5-mile length. There were three alternative strategies for selecting auxiliary units, as shown in Table 4. Our main concern at this point was physical access to the survey units, so by using base maps and airphotos, we selected auxiliary units which would facilitate logistics by lying close to an existing road. We found that in certain instances there was only one

<table>
<thead>
<tr>
<th>TABLE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALTERNATE STRATEGIES FOR AUXILIARY UNIT SELECTION</td>
</tr>
<tr>
<td>Strategy 1:</td>
</tr>
<tr>
<td>Strategy 2:</td>
</tr>
<tr>
<td>Strategy 3:</td>
</tr>
</tbody>
</table>

P= Primary sample unit  
A= Auxiliary unit

acceptable strategy. In others, however, there was more than one strategy available, creating a situation that allowed for some flexibility. To exploit this opportunity, we divided the selection of auxiliary units into two separate tasks which involved (1) those cases where selection was constrained, and (2) those cases where options obtained. The results of the first task were combined with the primary sample, and the distributions of the total scores were again compared using Chi-square (Table 3, Sample A1). We found that this operation did not change the similarity between sample and population to a major degree so we foresaw no problem in completing selection of the sample units.
Rather than approach the choice of the remainder of the auxiliary units in an arbitrary manner, we used the intermediate results of the statistical analysis of Sample A1. The contributions of each cell (row-column intersection) in the "sample" row to the total Chi-square value were examined (column 4 on the worksheet) for total scores. Environmental scores 1 & 2, 7, 8, and 9 are contributing most (i.e., deviate from expected) and total about 84% of the statistic (which is derived by summing column 4). Comparing the observed with expected values for these four cells we note that observed outweighs expected for cells 7 and 8, while in cells 1 & 2 and 9 there are relatively "too few" observed values. This indicates that we should select auxiliary units with total scores of 1 & 2 or 9, where possible, so that the observed and expected values will be brought closer together, hence decrease the value of the Chi-square statistic indicating that the sample is more closely representative of the universe. The Chi-square test for the combined primary and auxiliary units (Sample A2) is given in Table 3. Table 5 shows sample vs. universe tests on the basis of probability class rather than total score; the Chi-square values indicate the high degree of similarity between samples and the population. The sample selected for survey, on the basis of the variables used is a highly representative one. Table 6 lists the sample selected for field testing. Figure 3 depicts sample locations.

7. **Field Methods**

All units selected for survey were located on base maps and airphotos, and physical access routes were plotted. Once located on the ground, the unit was surveyed by the field crew which, with one individual on the route centerline and one each thirty meters to either side of the centerline, excavated test pits
<table>
<thead>
<tr>
<th>Sample P</th>
<th>Score Class</th>
<th>Low</th>
<th>Med</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universe</td>
<td>329</td>
<td>763</td>
<td>294</td>
</tr>
<tr>
<td></td>
<td>Sample</td>
<td>6</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Chi-square=0.51, d.f.=2, p(U=S)=.7735</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample A1</th>
<th>Score Class</th>
<th>Low</th>
<th>Med</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universe</td>
<td>329</td>
<td>763</td>
<td>294</td>
</tr>
<tr>
<td></td>
<td>Sample</td>
<td>13</td>
<td>35</td>
<td>19</td>
</tr>
<tr>
<td>Chi-Square=2.12, d.f.=2, p(U=S)=.3469</td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample A2</th>
<th>Score Class</th>
<th>Low</th>
<th>Med</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Universe</td>
<td>329</td>
<td>763</td>
<td>294</td>
</tr>
<tr>
<td></td>
<td>Sample</td>
<td>16</td>
<td>41</td>
<td>21</td>
</tr>
<tr>
<td>Chi-Square=1.53, d.f.=2, p(U=S)=.4657</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# TABLE 6

**PROBABILITY SAMPLE UNITS**

<table>
<thead>
<tr>
<th>LINK</th>
<th>MILE</th>
<th>TOWNSHIP LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>00.0-01.5</td>
<td>St. Francis, Me.</td>
</tr>
<tr>
<td>2</td>
<td>09.5-11.0</td>
<td>St. John, Me.</td>
</tr>
<tr>
<td>4</td>
<td>08.5-10.0</td>
<td>T15 R12, Me.</td>
</tr>
<tr>
<td>4</td>
<td>35.5-37.0</td>
<td>T12 R14, Me.</td>
</tr>
<tr>
<td>5</td>
<td>17.5-19.0</td>
<td>T6 R17, Me.</td>
</tr>
<tr>
<td>6</td>
<td>06.5-08.0</td>
<td>T4 R18 (Comestock), Me.</td>
</tr>
<tr>
<td>8</td>
<td>05.5-07.0</td>
<td>T3 R3 (Alder Brook), Me.</td>
</tr>
<tr>
<td>9</td>
<td>22.5-24.0</td>
<td>T7 R16 &amp; 17, Me.</td>
</tr>
<tr>
<td>9</td>
<td>49.0-50.5</td>
<td>Seboomook, Me.</td>
</tr>
<tr>
<td>10</td>
<td>00.5-02.0</td>
<td>Moose River, Me.</td>
</tr>
<tr>
<td>11</td>
<td>19.5-21.0</td>
<td>Holeb, Me.</td>
</tr>
<tr>
<td>12</td>
<td>08.0-09.5</td>
<td>T4 R7, ME.</td>
</tr>
<tr>
<td>14A</td>
<td>00.0-01.5</td>
<td>T2 R5 (Alder Stream), Me.</td>
</tr>
<tr>
<td>16</td>
<td>08.5-10.0</td>
<td>T5 R4 (Lynchtown), Me.</td>
</tr>
<tr>
<td>18-18A</td>
<td>04.5-06.0</td>
<td>Colebrook, NH</td>
</tr>
<tr>
<td>20</td>
<td>09.0-10.5</td>
<td>Stratford, NH</td>
</tr>
<tr>
<td>26</td>
<td>02.5-04.0</td>
<td>T4 R2 (Adamstown), Me.</td>
</tr>
<tr>
<td>29</td>
<td>02.0-03.5</td>
<td>Westworth Location, NH</td>
</tr>
<tr>
<td>35</td>
<td>01.0-02.5</td>
<td>Northumberland, NH</td>
</tr>
<tr>
<td>37</td>
<td>03.0-04.5</td>
<td>Lunenburg, NH</td>
</tr>
<tr>
<td>38</td>
<td>19.0-20.5</td>
<td>Dalton, NH</td>
</tr>
<tr>
<td>43</td>
<td>17.5-19.0</td>
<td>Marshfield, VT</td>
</tr>
<tr>
<td>44</td>
<td>02.5-04.0</td>
<td>Barnet, VT</td>
</tr>
<tr>
<td>46</td>
<td>04.0-05.5</td>
<td>Barre, VT</td>
</tr>
<tr>
<td>49</td>
<td>10.5-12.0</td>
<td>Richmond, VT</td>
</tr>
<tr>
<td>56</td>
<td>04.0-05.5</td>
<td>Williston, VT</td>
</tr>
</tbody>
</table>
Dickey/Lincoln Transmission - E.I.S. Project
Transmission Corridor Assessment

0 = Probability Sample
J = Judgement Sample
at thirty meter intervals (Lovis 1976). Test pits varied in depth depending upon soil conditions, extending only 10-20 cm. in the thin forest soils or up to a meter in silts associated with water features.

Despite inclement weather, the crew was able to spend the full thirty field-days as planned. When the probability sample was completed, field strategy turned to using "judgement" samples. As explained previously, this approach would tell us nothing about the universe as a whole, but we did use the opportunity to examine these points along the transmission network that could be identified as high-sensitivity zones, such as major river crossings or intersections with historic trails.

The field tactics used for judgement sampling were based on decisions by the field director according to the situation at each sample location. This manner of sampling supplemented the standard procedure and permitted additional survey in potentially sensitive areas.

The general procedure was to divide the crew in half, with three people located on either side of the linear feature; spaced at 30 yd. intervals in a line perpendicular to the linear feature. They then excavated test pits at 30 yd. intervals across the width of the corridor, parallel to the feature. Having finished a swath across the corridor, the crew would return on a parallel and adjacent swath using the same test pit spacing. A "zone" of test pits was thus created 150 yards wide on each side of the feature.

Conditions, however, did not always allow use of the general procedure. Of the fourteen sample locations given in Table 7, seven were not surveyed in their entirety. For units on Links 31 and 32 and for a portion of the units on Links 35 and 55, permissions for access and testing could not be obtained from property owners. These are the only instances in which we failed to gain necessary permissions; it is our policy not to enter private property without the owner's
or agent's express approval. Units on Links 28, 38 and 40 were not surveyed because of steep (greater than 10%) slopes or disturbance created by road construction and stream channelization. Small portions (less than 25%) of other units were not surveyed because of excessive slope and/or prior impact, but the remainder of units were surveyed.

Through judgement sampling, special attention was paid to riverbanks, floodplains, knolls, and the ridge tops. A few artifacts were found in the units in Links 9 and 56; these are discussed in the following section. The total area covered by judgement samples is about 0.53 of a square mile.

The locations of the judgement tests are listed in table 7 and located on figure 3.

8. Results of Fieldwork

In the course of reconnaissance for historic resources, 31 sites of potential significance were identified by the project historian. These are in addition to the 58 sites on state survey files which potentially might be impacted by transmission line construction.

Survey files identified 14 archaeological sites within the study area. The judgement tests located artifacts in two instances, near Bolton Falls along the Winooski River and in the area between Seboomook and Moosehead Lakes. These areas are adjacent to previously known sites that are located in situations that have seen a high degree of prior impact. We only note the finding of a handful of artifacts, but because of factors noted we have chosen not to identify these as new sites.
## TABLE 7
JUDGEMENT SAMPLE LOCATIONS

<table>
<thead>
<tr>
<th>Link</th>
<th>Mile</th>
<th>Township Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>48.7</td>
<td>Seboomook R4NBKP Me.</td>
</tr>
<tr>
<td>11</td>
<td>40.7</td>
<td>Chain of Ponds T2R6WBKP Me.</td>
</tr>
<tr>
<td>12</td>
<td>33.4</td>
<td>Jim Pond T1 R5WBKP Me.</td>
</tr>
<tr>
<td>28</td>
<td>3.2</td>
<td>Lincoln T5R2 Me.</td>
</tr>
<tr>
<td>31</td>
<td>4.5</td>
<td>Millsfield, N.H.</td>
</tr>
<tr>
<td>32</td>
<td>0.1</td>
<td>Northumberland, N.H.</td>
</tr>
<tr>
<td>35</td>
<td>4.8</td>
<td>Guildhall, Vt.</td>
</tr>
<tr>
<td>38</td>
<td>25.0</td>
<td>Peacham, Vt.</td>
</tr>
<tr>
<td>40</td>
<td>2.7</td>
<td>Littleton, N.H. - Waterford, Vt.</td>
</tr>
<tr>
<td>43</td>
<td>5.9</td>
<td>Peacham, Vt.</td>
</tr>
<tr>
<td>44</td>
<td>9.5</td>
<td>Ryegate, Vt.</td>
</tr>
<tr>
<td>49</td>
<td>0.5</td>
<td>Duxbury - Waterbury, Vt.</td>
</tr>
<tr>
<td>55</td>
<td>0.8</td>
<td>Williston - Jericho, Vt.</td>
</tr>
<tr>
<td>56</td>
<td>1.1</td>
<td>Williston - Jericho, Vt.</td>
</tr>
</tbody>
</table>
The probabilistic sample failed to uncover any evidence of cultural resources, hence we have no objective basis for deciding how good, bad or indifferent the predictive model actually is. We do feel, nevertheless, that the model is the best that could be constructed given the particular study area and previous knowledge about the area. We can offer two possible explanations to account for the failure to locate new sites, one of which is probabilistic, the other related to design considerations in the planning of the routes.

With regard to the prehistory of the study area, we can recall two factors which influence the probability of finding sites by statistically random methods. First, we note the relatively sparse population density: there were never great numbers of people inhabiting, or exploiting resources within, the study area. Second, it appears that the human population exploited/inhabited the area in small groups on a seasonal basis: the people who were there were never in one place very long. Taking these two factors together, it would seem that there would be few sites relative to the area (low site density), and that, with the exception of favored habitation or resource-extraction locations which were reoccupied, sites would be small in their physical dimensions. Given the small site sizes, natural (e.g., erosion) and cultural (e.g., plowing and lumbering) processes would destroy sites, further reducing the absolute density (Schiffer 1976). Comparing the total area covered by these few, small sites to that encompassed by the study boundaries, the location of any site must be considered a low-probability event (Read 1976). Combine this situation with a low-intensity sample (although we sampled more than 5% of the units, the field methods used effectively reduced the sample fraction by a factor of nearly ten
for the area surveyed), then it should be apparent that the location of more than a few sites could not be expected.

The second possible explanation to account for our failure to locate sites is not an alternative to the first, rather it is complementary. The engineers and architects involved in prehistory design of alternative proposed transmission routes had to consider a number of factors (interview with Lewis Bohl, civil engineer with the USDI Transmission Project Team, 1977). One of their most important considerations was cost-effectiveness, which translates into making proposed routes as short as possible. For this reason routes between Dickey and the Connecticut River form a nearly straight line, and are confined to the wooded interior uplands of northern Maine and New Hampshire. Potential water pollution (caused during the construction phase) was a concern, so routes were kept away from major water features where feasible or placed in upper portions of drainages where potential impact was reduced. A number of factors (including present land use, socio-economic and visual impact potentials) demanded, to the extent feasible, that routes be located away from contemporary population clusters. Since most towns and villages are located in what would be high-probability prehistoric site locations (early chronicles of some settlements note that many were founded on aboriginal campsites - Harp, 1977), the routing of the line avoids potential impact on cultural resources, as well as the other impact categories. By this point it should be apparent that concerns more or less tangential to cultural resources per se nevertheless have functioned directly to lessen potential impact on them. This has obvious implications for the expected results from any sample design for the study area as delimited.
9. Microwave Stations and Substations

While the major potential impact of this project results from transmission line construction, there are 8 new microwave communications towers and 6 additional substations planned. Because of their generally remote locations on hilltops or because they involve minimal additions to previously constructed facilities, they do not represent a major potential impact on cultural resources.

New microwave tower locations are planned on hills and low mountains with line-of-sight communications capability. Generally, these locations have a low potential for containing cultural resources as they were not generally the locus for any pattern of land use, either historically or prehistorically. It is possible that they could have been the location for a specialized activity (archaeologically, for mineral extraction; historically, as a forest fire lookout), but there is a low likelihood even for this type of activity. Additionally, the mineral composition of the geologic substrata in this region is generally granite, for which there was no apparent aboriginal use, especially on such eminences. Microwave towers have an overall low likelihood of impacting significant cultural resources.

New substations are planned in several locations, as are expansions of existing facilities. While these are generally located on flat-lying areas of alluvial or glaciofluvial deposition, none appear to be in a location of archaeological sensitivity, according to recent research conducted in Chittenden County by the State Archaeologist of Vermont (Giovanna Neudorfer, personal communication). However, inasmuch as these facilities occur in areas which would be considered of moderate archaeological potential, they should be surveyed prior to construction.

Neither the construction of microwave towers nor expansion of substations would directly impact standing structures. New substations would not have an
appreciable indirect impact on significant structures. Potential impact is generally limited to indirect or direct impact on unknown archaeological resources, for which survey would be an appropriate next step in the mitigation process.

Construction impacts from microwave tower locations and from substation construction are somewhat different from transmission facilities at this stage in the planning and impact assessment process. While it is likely that the final alignment of lines will diverge from that used as centerline in the accompanying report, facilities are unlikely to be moved more than several hundred feet, unless significant resources are encountered. However, since the possibility of moving facilities locations is a reasonable one, given design flexibility, we approached the assessment of existing environment and potential impact generally, rather than as a "clearance for construction" study. We evaluated the archaeological potential generally through an analysis of geomorphological setting (using aerial photographs, both vertical and oblique; and using USGS quadrangles) and field observation. However, vegetation precluded surface observation at all locations. Following preliminary evaluation from maps and aerial photographs, the following locations were observed on-the-ground: Hedgehog Mountain; both Jackman mid-point stations; Dickey and Lincoln School stations; and Owl's Head. All other new locations were observed from access roads or public ways. As a result of these background assessments and selected observations and walkovers, no cultural materials were observed. With the exceptions noted above, we expect that the potential impact would be minimal and that any impact potential determined during survey following facilities design and location could be mitigated by excavator or redesign.
III. DESCRIPTION OF THE EXISTING ENVIRONMENT: LINK EVALUATIONS

The following pages contain descriptions of the existing environment within the study area. The existing environment is defined as consisting of all historic and prehistoric sites (that is, cultural resources) known to exist within the study area. Every effort has been made to inventory these known sites. Such efforts have included walkover and windshield surveys, interviews with appropriate state and local officials, professionals and qualified amateurs, as well as a review of state survey files and of the relevant literature. Those resources identified only on the basis of our surveys have been included as parts of the existing environment. Since we are not in a position to evaluate the possible cultural significance of these "newly discovered" sites and since we wish to avoid any sins of omission, we have chosen to include these sites with those already considered significant to identify them all as having at least potential significance.

A. SEGMENT "A": DICKEY TO LINCOLN SCHOOL TO FISH RIVER

For Link Nos. 1, 1A, 1B, 1C, 2 and 3 there exist no known sites of potential cultural significance within 0.25 mi. of either side of the proposed right of way centerlines. Link 1 contains three sites outside the route, but within the viewshed:

1. Link 1 contains (DLS 01/2/1)*, an Indian burial ground reported by Dawn Nadeau, local historian in St. Francis, Maine. DLS 01/3/2* is the site of the Xavier Cyr mill, cited in the St. Francis Bicentennial

* Site numbers marked with an asterisk (*) indicate sites in the viewshed.

Site numbers with no asterisk indicate sites in the route.
Committee Memoirs. No structure presently stands. DLS 01/3/3* is the Villa d'Aigle house, the earliest house in St. Francis, reported by Dawn Nadeau.

B. SEGMENT "B": DICKEY TO JACKMAN OR MOOSE RIVER

For Link Nos. 4-9, 9A, 10, 11A and 12A there exist no known sites of potential cultural significance within 0.25 mi. of either side of the proposed right of way centerlines. Sites have been reported outside the route, but within the viewshed for Links 8 and 9:

1. Link 8 contains DLS 08/3/1*, an archaeological site reported by the Maine State Archaeological Survey (Me 129-1).
2. Link 9 contains DLS 09/49/1*, an archaeological site containing artifacts of the Moorehead complex. This site was reported by the Maine State Archaeological Survey (Me 131-1).

C. SEGMENT "C": JACKMAN OR MOOSE RIVER TO MOORE

Of the 32 links which make up Segment "C" (Nos. 11-13, 13A and 14-40), eight have at least one known site of potential cultural significance. Those links with known sites are nos. 18, 30 and 35-40.

1. Link 18 contains one site within the route: DLS 18/7/1, a badly deteriorated round barn constructed during the 19th century. The site was identified during windshield survey.
2. Link 30 contains one site within the route: DLS 30/6/1, an aboriginal campsite of undetermined age and cultural affiliation.
Site identification was made from a reference in Robert E Pike's *Spiked Boots* (1959). No attempt was made to verify the site's existence or present condition.

3. **Link 35** contains two sites within the route: DLS 35/7/3 and DLS 35/7/4. Both sites are two story frame houses constructed during the 19th century and cited in Beer's *Atlas*. The houses are located on opposite sides of the proposed right of way centerline near this link's termination point.

Sites outside the route but within the viewshed include DLS 35/1/1*, the remains of Fort Wentworth, built by Roger's Rangers in 1775, reported by the Vermont State Historic Preservation Officer. DLS 35/4/2*, remains of a mid-18th century fort, reported by the Guildhall Postmaster. DLS 35/4/5*, the Guildhall Common Area, DLS 35/6/6*, former Central School and DLS 35/6/7*, Old Home Crawford, cited in the Town of Guildhall Municipal Development Plan.

4. **Link 36** contains one site within the route: DLS 36/8/1 which consists of cellar hole(s), evidence of the previous existence of house(s) of the historic era. This information was obtained from the Town Clerk of Lunenburg, Vermont. The location was not checked for ground-truth.

5. **Link 37** contains two sites within the route: DLS 37/8/1 and DLS 37/10/2, both of which are cemeteries dating to the 19th century. DLS 37/10/2 contains gravemarkers inscribed with dates from the early part of the 19th century. Although these locations
are not marked on the USGS map (Quad 61: Whitefield, NH-VT) their existence was verified by the project historian. Sites outside of the route, but within the viewshed include 37/1/1*, a reported Indian camp. DLS 37/1/2*, the Benton house, built in 1778. DLS 37/2/5*, former Riverside School, cited in Town of Guildhall Municipal Development Plan. DLS 37/7/6*, Historic Site Type 3, DLS 37/8/7*, Site Type 2, DLS 37/8/8*, Site Type 1 cited in Unique or Fragile areas, Essex County 4, Vermont Land Capability Plan, 1972.

6. Link 38 contains two sites within the route: DLS 38/18/3 is a number of 19th century frame houses located along U.S. Route 3 in Whitefield, New Hampshire. The construction dates were verified by Mr. Barn, a Selectman of Whitefield. DLS 38/18/4 is a two story red brick house with a frame addition. According to a plaque attached to the house, construction was initiated in 1823.

Outside the route, but within the viewshed are DLS 38/8/1*, a covered bridge built in 1862, DLS 38/8/2*, a brickyard. DLS 38/8/6*, Holton House Historical Museum (N.H. Historical Marker 84) and DLS 38/10/7*, Thaddeus S.C. Lowe birthplace (N.H. Historical Marker 19) cited in New Hampshire Historical Markers, State Historical Commission, 1974.
7. **Link 39** contains one site, DLS 39/6/1, a cemetery dating to the early 19th century. The site's position is noted on USGS map, Quad 60: Littleton, NH-VT. Its early use was verified by the project historian from gravemarker inscriptions.

8. **Link 40** contains one site outside the route, but within the viewshed. DLS 40/1/1* is a standing structure built in 1820, cited in General Plan Report, Littleton, N.H., 1969.

D. **SEGMENT "D": MOORE TO GRANITE**

Of the five links within Segment "D" (Nos. 41-45), three contain at least three known sites of potential cultural significance. Links with known sites within the route are 42, 43 and 44. Links that include sites within the viewshed are:

1. **Link 42** contains three sites within the corridor, one historic (DLS 42/2/1) and two prehistoric (DLS 42/8/2 and 42/8/3). The first is a cemetery dating back to the 19th century. Its location is noted on USGS map, Quad 60: Littleton, NH-VT. Dating was verified by the project historian from gravemarker inscriptions. DLS 42/8/2 is a small aboriginal campsite occupied sometime during the 2.5 millenia preceding the historic era. DLS 42/8/3 is in close proximity to the above site, and apparently was a lithic (stone tool) workshop although the location may have been used for habitation as well. This site was diagnosed as belonging to the same time period.
(i.e. Woodland) as DLS 42/8/2 despite the fact that an artifact
diagnostic of the Archaic (antedating ca. 2000 B.C.) was found on
the site's periphery. Both of these sites were found in 1973 by
University of Vermont crews surveying the Interstate-91 right of way.
I-91 construction avoided these sites.

Outside the route, but within the viewshed is DLS 42/7/1*, an
archaeological site of unknown identity cited by the Vermont State
Archaeological Survey (UT-CA-6).

2. **Link 43** contains five sites within the proposed route: DLS 43/6/2,
DLS 43/8/6 and DLS 43/20/7 are standing houses and are cited in
**Beer's Atlas** (1875). With the exception of DLS 43/6/2 which was built in
1787, all houses were constructed in the 19th century. 43/7/5 is
an historic resource of unknown identification.

Outside the route, but within the viewshed are: DLS 43/6/3*,
blockade and stockade site, cited by the Peacham Historical Society.
DLS 43/7/4*, Peacham Academy, built in 1797, reported by A. Lamoureaux,
Peacham Town Clerk. DLS 43/21/8*, a 19th century farmhouse.

3. **Link 44** contains five sites within the proposed route: DLS 44/7/1,
DLS 44/14/2, DLS 44/14/3, DLS 44/28/12 and DLS 44/28/13.

DLS 44/7/1 is the designation for the unexcavated remains of an 18th
century (?) blockhouse, artifacts from a nearby field, which are said
to be the remnants of a skirmish that took place during the French
and Indian War, and fields on either side of the Bailey-Hazen Military
Road (formerly an aboriginal trail) that reportedly contain artifacts.
DLS 44/14/2 and DLS 44/14/3 are both two story frame houses constructed during the 19th century; both are cited in *Beer's Atlas* (1875).


DLS 44/28/13, the Joseph Calef place (the Morin Place) built in 1795, is cited as Historic Site 8 in Proposed Plan for Washington, Vermont. The Washington Town Planning Commission states that the structure is one of the earliest houses still standing in town and suggests that an historic site marker be provided.

Outside the route, but within the viewshed are: DLS 44/10/4*, Historic Site Type 3, cited in Unique or Fragile Areas, Caledonia County 4, Vermont Land Capability Plan, 1972.

DLS 44/26/4*, and DLS 44/26/5*, are 19th century framehouses.

DLS 44/26/6*, the Washington Creamery, DLS 44/26/7*, Catholic Church, DLS 44/26/5*, the Washington House, DLS 44/26/9*, Universalist Church, DLS 44/26/10*, Baptist Church and DLS 44/27/11*, the E.P. Parker Hotel are cited in the proposed plan for Washington, Vermont, 1973.

E. SEGMENT "E": GRANITE TO ESSEX

Segment "E" consists of fifteen links (Nos. 45A, 45B, 45C, 46, 47, 47A and 48-56), eight of which contain known sites of potential cultural significance. Those eight are Links Nos. 46, 47, 47A, 48, 49, 50, 55 and 56.
1. Link 46 contains three sites within the proposed route:

   DLS 46/4/1 and DLS 46/5/2 are 19th century farm complexes cited in Beer's Atlas (1871).

   DLS 46/2/3 is an historic site type 1 cited in Unique of Fragile Areas, Orange County 4, Vermont Land Capability Plan, 1972.

   Sites outside the route, but within the viewshed are: DLS 46/2/4*, historic site type 4, DLS 46/4/5*, historic site type 1h, and DLS 46/4/6*, historic site type 1, cited in Unique or Fragile Areas, Orange County 4, Vermont Land Capability Plan, 1972.

2. Link 47 contains one site within the proposed corridor: DLS 47/3/1 a round wooden silo cited in Beer's Atlas (1871).

   Outside the route, but within the viewshed is site 47/3/2*, a 19th century brick foundation.

3. Link 47A contains two sites within the proposed route: DLS 47A/1/1 and DLS 47A/2/2, farmhouses which date to the 19th century (the latter to 1833) cited in Beer's Atlas (1871).

4. Link 48 contains five sites that are outside the route, but within the viewshed: DLS 48/3/1*, DLS 48/3/2*, DLS 48/3/3*, DLS 48/3/4*, and DLS 48/2/5*, are historic sites types 4h, cited in Unique or Fragile Areas, Washington County 4, Vermont Land Capability Plan, 1972.

5. Link 49 contains seven sites within the proposed route: DLS 49/1/1 is the known archaeological site, and is located in the vicinity of Bolton Falls. Archaic, Woodland and possibly early-historic Iroquois materials have been discovered at this locus.
The remainder of the sites on this link are listed on the Vermont State Historic Survey. Residences include sites DLS 49/3/2, DLS 49/4/3 and DLS 49/4/4. DLS 49/7/5 includes the Murray farm, Machia residence, Hugo residence, Lavanway residence, Quinn's Store and Jonesville Bridge. DLS 49/11/10 is the Westfall farm. DLS 49/11/11 is the Route 20 bridge.

Outside the route, but within the viewshed are: DLS 49/10/6*, North Main Street District, DLS 49/10/7*, Albert Towne house, DLS 49/10/8*, Sunshine farm, DLS 49/11/9*, Gleason farm-Peet residence, DLS 49/12/12*, John Thompson house, DLS 49/12/13*, Checkered house, DLS 49/12/14*, Riverside farm, and DLS 49/12/15*, Conant Tenant house. These sites are cited in the Vermont State Historic Survey.

6. **Link 50** contains one site outside the route, but within the viewshed: DLS 50/2/1*, historic site type 3, cited in Unique or Fragile Areas, Orange County 4, Vermont Land Capability Plan, 1972.

7. **Link 55** contains four sites within the proposed route all of which are on the Vermont State Historic Survey records. Sites DLS 55/1/3, DLS 55/3/6 and DLS 55/5/10 are farmsteads. Site DLS 55/5/9 is the Van Schoppe house.

Outside the route, but within the viewshed are: DLS 55/1/1*, Farr house, DLS 55/1/2*, Lois Clark house, DLS 55/3/4*, Bland house, DLS 55/3/5*, School House No. 10, DLS 55/4/7*, Exerman house and DLS 55/4/8*, Martel Schoppe house. These sites are cited in the Vermont State Historic Survey.
8. **Link 56 contains five sites, all of which are outside the route, but within the viewshed:** DLS 56/3/1*, Chapman farm, DLS 56/3/2*, Gentes House, Lampman house, Bland house, Willard House, Engels house, Whitcher house, District School #2, DLS 56/4/3*, Babcock house, DLS 56/5/4*, Wisehart house, cited in the Vermont State Historic Survey. DLS 56/2/5*, is historic site type 3 cited in Unique or Fragile Areas Chittenden County 4, Vermont Land Capacity Plan, 1972.

F. **THE EXISTING ENVIRONMENT: ROUTE EVALUATIONS**

The following chart summarizes the evaluation of the various route alternatives provided by the USDI. Some flexibility obtains, given that localized routing alternatives (LRA's) are available to the evaluator within various routes. In making evaluations it was assumed that an LRA containing fewer known cultural resources was the better option. Hence routes within Segment "C" use LRA's III-2, V-1 and VII-1 because these contain fewer sites than the alternatives. It was found that Segment "C" is the only segment where such choices between LRA's needed to be made.
## The Existing Environment

**Link No. 1**

**Cultural Resources: Number of Known Sites**

Length: 16.9m

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|      |
| **HISTORICAL:** |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| Nat'l Register  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 1    |
| State Survey    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |      |
| Other Source    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 1    |
| **ARCHEOLOGICAL:** |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |      |
| Nat'l Register  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |      |
| State Survey    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 2    |
| Other Source    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 2    |
| **TOTALS**      | 2 | 1 |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 3    |

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Dickey/Lincoln School Lakes Transmission - E.I.S. Project Environmental Assessment of Alternative Routes

1 of 1
The Existing Environment
Link No. 8
Cultural Resources: Number of Known Sites Length: 10.3 mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|       |
| HISTORICAL:    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| ARCHEOLOGICAL: |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    | 1  |    |    |    |    |    |    |    |    |    |    |       |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 1     |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
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Dickey/Lincoln School Lakes Transmission - E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment
Cultural Resources: Number of Known Sites Length: 63.6 mi.

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Dickey/Lincoln School Lakes Transmission - E.I.S. Project Environmental Assessment of Alternative Routes
# The Existing Environment

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# The Existing Environment

**Link No. 30**

**Cultural Resources:** Number of Known Sites Length: 5.3 mi.

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Dickey/Lincoln School Lakes Transmission • E.I.S. Project

**Environmental Assessment of Alternative Routes**
### The Existing Environment

**Link No. 35**

**Cultural Resources: Number of Known Sites**

Length: 6.3 mi.

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**Dickey/Lincoln School Lakes Transmission • E.I.S. Project**

**Environmental Assessment of Alternative Routes**
The Existing Environment Link No. 36
Cultural Resources: Number of Known Sites Length: 18.7 mi.

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Dickey/Lincoln School Lakes Transmission • E.I.S. Project Environmental Assessment of Alternative Routes
The Existing Environment

Cultural Resources: Number of Known Sites Length: 11.8 mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|-------|
| HISTORICAL:    |   |   |   |   |   |   |   |   |   | 1  | 1  | 2  |    |    |    |    |    |    |    |    |    | 4    |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 3    |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 4    |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 3    |
| ARCHEOLOGICAL: |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 1    |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 1    |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 1    |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 1    |
| TOTALS         | 2 | 1 | 1 | 3 | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 8 |

Dickey/Lincoln School Lakes Transmission • E.I.S. Project

Environmental Assessment of Alternative Routes
The Existing Environment

Cultural Resources: Number of Known Sites Length: 25.8 mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|      |
| **HISTORICAL:** |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |      |
| Nat'l Register |   |   |   |   |   |   |   | 1 | 1 |    |    |    |    |    |    |    |    |    |    |    | 2    |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 2    |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 4    |
| **ARCHEOLOGICAL:** | | | | | | | | | | | | | | | | | | | |      |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 3    |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 1    |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 2    |
| **TOTALS**     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 6    |

Dickey/Lincoln School Lakes Transmission - E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment

Link No. 39

Cultural Resources: Number of Known Sites Length: 55 mi.

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Dickey/Lincoln School Lakes Transmission - E.I.S. Project

Environmental Assessment of Alternative Routes
The Existing Environment

Cultural Resources: Number of Known Sites Length: 3.0 mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|       |
| HISTORICAL:    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |       |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 1     |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 1     |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |       |
| ARCHEOLOGICAL: |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |       |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |       |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |       |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |       |
| TOTALS         | 1 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 1     |
The Existing Environment  
Cultural Resources: Number of Known Sites Length: 9.1 mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|-------|
| HISTORICAL:     |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| Nat'l Register  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| State Survey    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| Other Source    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 1    |
| ARCHEOLOGICAL:  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| Nat'l Register  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 3    |
| State Survey    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 2    |
| Other Source    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       |
| TOTALS          | 1 | 1 | 2 |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 4    |

Dickey/Lincoln School Lakes Transmission • E.I.S. Project 
Environmental Assessment of Alternative Routes

1 of 1
## The Existing Environment

**Link No. 43**

**Cultural Resources: Number of Known Sites Length: 30.4 mi.**

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|      |
| HISTORICAL     |   |   |   |   |   |   |   |   |   | 1  | 1  | 2  | 1  |    |    |    |    |    |    |    | 1    |
| Nat'1 Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Other Source   | 1 | 1 | 2 | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| ARCHEOLOGICAL  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Nat'1 Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |
| Other Source   | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| **TOTALS**     | 1 | 2 | 2 | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 1    |

Dickey/Lincoln School Lakes Transmission • E.I.S. Project

Environmental Assessment of Alternative Routes
The Existing Environment

Cultural Resources: Number of Known Sites Length: 30.4 mi.

| Mile Reference 20+ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|-------------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|--------|
| HISTORICAL:       |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   7    |
| Nat'l Register    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   7    |
| State Survey      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   7    |
| Other Source      | 1 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   1    |
| ARCHEOLOGICAL:    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   1    |
| Nat'l Register    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   1    |
| State Survey      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   1    |
| Other Source      |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   1    |
| TOTALS            | 1 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |   8    |

Dickey/Lincoln School Lakes Transmission E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment  
Cultural Resources: Number of Known Sites Length: 27.2mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|------|
| HISTORICAL:    |   |   |   |   |   |   |   |   |   | 1  |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey   |   |   |   |   |   |   |   |   |   |    | 2  |    |    |    |    |    |    |    |    |    |    |     |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| ARCHEOLOGICAL: |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    | 1  |    |    |    |    |    |    |    |    |    |     |

TOTALS          | 1 | 1 | 2 |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |       

Dickey/Lincoln School Lakes Transmission • E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment  

Cultural Resources: Number of Known Sites Length: 27.2 mi.

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Dickey/Lincoln School Lakes Transmission • E.I.S. Project  

Environmental Assessment of Alternative Routes
The Existing Environment

Cultural Resources: Number of Known Sites Length: 67 mi.

| Mile Reference | 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|      |
| HISTORICAL:    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |
| Nat'l Register | 2  | 2  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 4    |
| State Survey   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 4    |
| Other Source   | 1  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 2    |
| ARCHEOLOGICAL: |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |
| Nat'l Register |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |
| State Survey   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |
| Other Source   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |      |
| TOTALS         | 2  | 3  | 1  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | 6    |

Dickey/Lincoln School Lakes Transmission - E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment

Cultural Resources: Number of Known Sites Length: 4.2 mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|     |
| HISTORICAL:    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 2   |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source   | 2 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| ARCHEOLOGICAL: |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| TOTALS         | 2 |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 2   |

Dickey/Lincoln School Lakes Transmission - E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment
Cultural Resources: Number of Known Sites Length: 7.9 mi.

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Dickey/Lincoln School Lakes Transmission • E.I.S. Project
Environmental Assessment of Alternative Routes
# The Existing Environment

**Cultural Resources: Number of Known Sites Length: 3.4 mi.**

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|-------|
| HISTORICAL:    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source   | 1 | 1 |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| ARCHEOLOGICAL: |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| TOTALS         | 1 | 1 |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |

**Dickey/Lincoln School Lakes Transmission - E.I.S. Project**

**Environmental Assessment of Alternative Routes**
The Existing Environment
Cultural Resources: Number of Known Sites Length: 12.2mi.

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Dickey/Lincoln School Lakes Transmission • E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment

Link No. 50

Cultural Resources: Number of Known Sites Length: 6.9 mi.

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Dickey/Lincoln School Lakes Transmission · E.I.S. Project
Environmental Assessment of Alternative Routes
The Existing Environment
Cultural Resources: Number of Known Sites Length: 4.9 mi.

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|     |
| HISTORICAL:    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 10 |
| Nat'l Register | 3 | 3 | 2 | 2 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 10 |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| ARCHEOLOGICAL: |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 10 |
| Nat'l Register |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source   |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| TOTALS         | 3 | 3 | 2 | 2 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    | 10 |

Dickey/Lincoln School Lakes Transmission • E.I.S. Project
Environmental Assessment of Alternative Routes
### The Existing Environment

#### Cultural Resources: Number of Known Sites

- **Length:** 5.1 mi

| Mile Reference | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | Totals |
|----------------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|     |
| **HISTORICAL:** |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register  |   | 1 | 2 | 1 | 2 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 5  |
| State Survey    |   | 1 | 2 | 1 | 2 |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| **ARCHEOLOGICAL:** |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Nat'l Register  |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| State Survey    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| Other Source    |   |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |     |
| **TOTALS**      | 1 | 2 | 1 | 2 |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    | 5  |
# The Existing Environment

## Cultural Resources: Number of Known Sites

| Segments: | A1 | A2 | B1 | B2 | C1 | C2 | C3 | C4 | C5 | C6 | D1 | D2 | E1 | E2 | E3 | E4 | E5 |
|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Routes:   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| HISTORICAL: |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Nat'l Register | 4 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 9 | 32 | 28 | 29 | 24 | 28 | 23 | 28 | 23 |
| State Survey | 2 | 2 | 5 | 5 | 2 | 2 | 5 | 5 | 5 | 8 | 6 | 6 | 2 | 2 | 4 | 4 | 6 | 6 |
| Other Source | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| ARCHEOLOGICAL: |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Nat'l Register | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| State Survey | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Other Source | 1 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| TOTALS | 3 | 0 | 1 | 0 | 1 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 18 | 12 | 39 | 35 | 32 | 27 | 33 | 28 | 35 | 30 |

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Dickey/Lincoln School Lakes Transmission · E.I.S. Project

Environmental Assessment of Alternative Routes
IV. IMPACT ASSESSMENTS AND MITIGATING ACTIONS

Potential impact on cultural resources caused by construction, operation or maintenance of this transmission line consists largely of two types. **Direct impact** here refers to actual physical alteration of a site during construction of access roads and transmission towers or during the stringing of the line itself. **Indirect impact** here refers to the visual intrusion of the completed line and facilities on the integrity of a cultural setting.

To facilitate the discussion, we distinguish three types of cultural sites: archaeological, historic and cemeteries. Archaeological refers to below-ground historic and prehistoric sites. Historic refers to standing structures and other above-ground historic resources, e.g., The Guildhall Commons, DLS 35/4/5*. A cemetery refers to a known historic burial ground that has extant, above-ground grave markers.

Distinguishing between impact types and site types, and by simultaneously considering impacts and their possible mitigative measures, we can deal directly with the array of potential impacts. The potential impact vulnerability of a site is qualitatively stated by applying the United States Department of Energy impact nomenclature that rates potential impact as severe, high, moderate, low, or none (Table 8). (Murray and Wilkerson, personal communication, 1977).

In gauging mitigation of potential impacts, we have been guided by "Environmental Criteria for Electric Transmission Systems" (USDI and USDA, 1970) and by "Mitigation Measures" (USDI, 1977) which was prepared especially for this study by the Department of Interior project team (USDI, 1977 is included in Appendix E).
TABLE 8

POTENTIAL IMPACT VULNERABILITY OF SITES

(Ar = Archaeological, H = Historic, Ce = Cemetery

* indicates site in viewshed. No * indicates site within route

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A. Impacts, Mitigation and the Existing Environment

1. Direct Impact

Direct impact potentially affects those cultural resources located within one-quarter mile of either side of any proposed transmission line location. Such sites may incur physical alteration either from construction of the transmission line and towers or from construction of attendant access roads and facilities. Because the Department of Interior is committed, under normal circumstances, to physical avoidance of potentially endangered sites (USDI, 1977b:16-18), and given that, under normal circumstances, such avoidance is both practical and efficacious, we identify only a minor concern with potential direct impact on those resources identified as cemeteries or as standing structures. All sites in these categories, by reason of their high degree of visibility, can be avoided easily during the project's construction phase. The potential direct impact on these sites should be "low".

In contrast, we identify a major concern with sub-surficial resources referred to as "archaeological". The degree of concern reflects in part the extent of our knowledge about these resources since we know relatively less about them than the other types. While we are confident that we have identified most, if not all, of the standing structures and cemeteries, only previously known (from site files and the published literature) archaeological sites have been identified. Further work is required during subsequent phases of the project, including archival research to locate those historic sites no longer standing but plotted on early maps, and an intensive right of way survey designed primarily to locate prehistoric sites. USDI has indicated its intention to have professional archaeologists conduct such an
intensive survey (Chapter I, herein, and USDI 1977b:17). Any potential direct impact on sub-surficial resources can be mitigated by avoidance or excavation once the sites have been identified.

Our major concern also extends to those sites which may be buried too deeply to be revealed by even the intensive survey (we note that footings for transmission towers may extend as deep as ten feet which is deeper than surveyor test-pits usually extend). In this regard, USDI has made its commitment known (ibid.):

If in the course of construction an archaeological site is discovered, the contractor or construction inspector are required to report the site and suspend activities in the area until the site can be investigated by an archaeologist. Artifacts which have been disturbed are to be retained by the construction inspector for the archaeologist. Objects still in place are to be protected from vandalism and are not to be moved.

In each and every such instance, a decision concerning appropriate mitigative action must be made. The decision may entail a minor redesign of the line or, if relative costs warrant, excavation may be required. It must be noted that unplanned, last-minute, expensive exigencies may appear during the construction phase, and at that time the only alternative to moving the line will be to move the site. Because of our limited knowledge of these sites and due to the possibility of disturbance during transmission line construction, impact on these sites could be "high".

2. **Indirect Impact**

Indirect impact (herein, the visual intrusion that the constructed transmission line may impose on the integrity of a cultural setting) is deemed as affecting only those cultural resources referred to as historic, and even here there are varying degrees of impact severity depending upon the status of the particular resource. In our judgement, the aesthetic integrity of cemeteries and of archaeological sites is of relatively minor concern. While these types of sites have
intrinsic scientific value, there is none presently known from the study area of such quality that it might be considered of National Register status, hence our determination that potential indirect impacts for these resource types is "low".

Unlike direct impact, indirect (or visual or aesthetic) impact is not a presence/absence determination, rather it is a qualitative one depending on a number of criteria. For a standing structure to be considered of great historical importance, it must (1) have some antiquity, that is, usually it must be in excess of fifty years of age, and/or (2) bear a direct relation to some historically important personage or event, and/or (3) be reflective of an era in terms of its mode of construction or style of architecture (or it may be unique in regard to construction or style of architecture). Beyond historical context, physical condition and context must also be considered. All of the above determinations may be insufficient if the structure has failed to maintain its integrity, its unimpaired physical condition - for instance, an 18th century brick house with the addition of double-glazed aluminum windows has undoubtedly lost some of its original charm. In terms of context, an 18th Century brick house might be in pristine condition but be flanked by double-glazed aluminum fast-food joints that detract from its integrity. Already existing alterations of a structure's condition or context may be referred to as prior impact.

In identifying historic standing structures as cultural resources (i.e., those not already listed by state survey or placed on, or determined eligible for, the National Register of Historic Places) we have considered only the age
of the structure, an admittedly minimal guideline. We are not in a position to make extensive evaluations of the possible significance of a site, and, by using a structure's age, thus have erred in the direction of generosity rather than parsimony. Given the nature of this report, our primary concern is not so much with the resources themselves as with their physical context.

Indirect impact may affect not only those structures within the corridor but also those outside of the corridor from which the constructed line would be visible. The total area from which the line may be visible is referred to as a "viewshed". All structures within the viewshed are potentially subject to indirect impact. The physical presence of the line may dominate the landscape to the extent that it detracts from a site's context, intruding as an anomaly.

The assessment of visual impact is not a simple, straightforward task. There are a number of factors that must be considered, including distance of viewer from transmission facility, number of viewers, the absorption capabilities of the landscape (transmission routes tend to avoid ridgetops where facilities would be "skylined"), the nature of the view (perpendicular to the line, adjacent and parallel, or somewhere in between) and the amount of line that is viewed, along with other factors of lesser importance (Committa Frederick Associates, Environmental Planning and Design Consultants, West Chester, Pennsylvania, personal communication 1977). Since indirect impact assessment requires expertise beyond our current capabilities, and since the cultural resources comprise a subset of structures and locations subject to visual intrusion, we refer those interested
to the report for visual/recreational resources prepared by Committa Frederick Associates, an environmental planning and design consultant firm also involved in the Transmission Project.

While a precise assessment of visual impact on specific resources is beyond the scope of this study, it is appropriate to present the following table of visual impact potential as a general reflection of the relation between the proximity of facility intrusion and the resource's significance.

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<th>Medium</th>
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TABLE 9

VISUAL IMPACT POTENTIAL

Resource Significance

High    Low

Near    Severe Medium
While the significance of each resource encountered in this study is not presently assessible, in particular with regard to the criteria of the National Register of Historic Places, it is possible to measure proximity by distance to the identified center line of alternate routes (Table 8). The present state of the art of impact assessment does not allow the precise evaluation of the effect of viewing the line from a cultural resource nor do the present data allow the potential impact of such intrusion on particular resources (e.g., point impact) to be assessed. Our recommended survey of the final route should yield such information and a precise assessment of potential impact and appropriate measures for its mitigation. In the absence of such precise information at this level of study, we have chosen to rely on the quantification of presence/absence information to present these data on a link-by-link basis. Table 8 depicts indirect impact as an inverse function of distance. Sites 0.0 to 0.3 miles from the centerline are suggested to have "high" indirect impact vulnerability. Sites 0.4 to 0.6 miles away have "moderate" impact vulnerability and sites 0.7 from the centerline have "low" impact vulnerability.

Indirect impact may also involve those affects of construction and operation not directly related to the actual behavior or construction/operation processes. These indirect potentials include the results of a stimulus to regional development which may result from facilities construction and the overall impact of "opening the country" by building the line and its facilities. This increased public and private access to this region may result in increased illicit artifact collection (often called, pejoratively, pot hunting). However, from our research on the character and location of cultural resources in this area, the overall impact of such processes will be minimal, or "low".
3. **Mitigation Measures for Reducing the Impact Potential on Cultural Resources.** In general, once resources are identified and evaluated, the potential impact may be reduced by either removing the resource (or recovering its significant parts from the field of the resource). Simply, one can either alter the resource or alter the proposed facility. While a cultural resource conservation ethic places priority on altering the design to conserve the resource by avoidance, this choice may be constrained by other cultural values, such as the need for cost-effective energy transmission, etc. The final selection of mitigation measures will reflect compromise choices among several feasible alternatives, determined once a final route is selected.

Mitigation measures which alter the planned construction include the relocation of facilities away from the resources (the siting of substation, roads tower relocation, etc.) and changing facilities design while maintaining their location (reducing tower height, substitution of poles for lattices in tower construction, painting towers to reduce visibility, constructing temporary workpads as buffers for temporary construction locations, etc.).

Mitigation measures which remove or recover data from the resource include removal of the cultural resource from the impact zone (relocation of standing structures or objects of antiquity which are portable) or the recovery of data which contribute to the significance of the resource (archaeological excavation, recording of the standing structure's characteristics, etc.). Where other constraints prevent mitigation by avoidance, these measures have been acceptable.
B. Theoretical Approach To Potential Impact Prediction

The environmental-factor scoring system developed in conjunction with the predictive model for site location (Chapter II) may also be used to assess potential impact on a link-by-link basis throughout the network. A summary value for each link was obtained by calculating the mean of the Total Scores for any given link (Table 8). Where individual links had to be compared, we used the computed standard deviation for each link: if each mean value was within the range embraced by one standard deviation of the compared mean, we judged that there was no significant difference in potential impact between the links. In the absence of demonstrably significant differences, this posture minimizes the possibility of basing decisions on insignificant differences in environmental scores. Where groups of links (i.e., an alternative route - see Chapter I and Appendix E for definitions of terms) had to be compared with other groups we used the mean of link-means and the attendant standard deviation. The determination of significant differences between routes was judged using the same one standard deviation guideline. Table 12 includes a "worksheet" portion which illustrates the method by showing the calculations for the Localized Routing Alternatives. Table 11 indicates which links comprise the LRA's and the routes. Table 13 indicates our route preferences. It should be noted that in calculating the Route Values the lowest-valued LRA was used, whether or not there actually were significant differences between the LRA's.
This conservatism reflects our unwillingness to utilize a tentative and untested model of environmental factors with which to evaluate archaeological potential. In point of fact, some would argue that even one standard deviation is a minimal level of deviation from which to infer a significant difference. Our statistics demonstrate the overall similarity among alternates within this study universe, when evaluated at this scale for this purpose.

If these variables scores were normally distributed, a difference greater than one standard deviation from the mean for any single variable would occur approximately three times out of ten by chance alone. However, this indicates that such a deviation has a probability of 0.7 of being a statistically significant difference. We chose this level of difference because it is easily calculated and manipulated and because the odds of 7:3 approximate an appropriate bias against making a spurious inference of significant difference, given the low level of specificity of our present model.
TABLE 10

DESCRIPTIVE STATISTICS FOR LINKS

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### TABLE 11

**LINKS COMPRISING LRA'S AND ROUTES**

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**LOCALIZED ROUTING ALTERNATIVE PREFERENCES**

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<td>3.30-7.16</td>
<td></td>
</tr>
<tr>
<td>C₁₄</td>
<td>5.15</td>
<td>3.36-6.94</td>
<td></td>
</tr>
<tr>
<td>C₂₁</td>
<td>5.00</td>
<td>3.36-6.64</td>
<td></td>
</tr>
<tr>
<td>C₂₂</td>
<td>5.38</td>
<td>3.82-7.94</td>
<td></td>
</tr>
<tr>
<td>C₂₃</td>
<td>5.36</td>
<td>3.76-6.97</td>
<td></td>
</tr>
<tr>
<td>C₂₄</td>
<td>5.50</td>
<td>3.86-7.14</td>
<td></td>
</tr>
<tr>
<td>D₁</td>
<td>4.86</td>
<td>2.83-6.89</td>
<td>No significant difference</td>
</tr>
<tr>
<td>D₂</td>
<td>4.81</td>
<td>2.78-6.84</td>
<td></td>
</tr>
<tr>
<td>E₁₁</td>
<td>6.42</td>
<td>5.67-7.17</td>
<td>Significant differences exist between the E-2's and E-1's, and E-2's and E-4's, with the E-2's being preferred in both cases. No other significant differences.</td>
</tr>
<tr>
<td>E₁₂</td>
<td>6.47</td>
<td>5.73-7.21</td>
<td></td>
</tr>
<tr>
<td>E₂₁</td>
<td>5.94</td>
<td>5.53-6.35</td>
<td></td>
</tr>
<tr>
<td>E₂₂</td>
<td>5.99</td>
<td>5.57-6.41</td>
<td></td>
</tr>
<tr>
<td>E₃₁</td>
<td>6.04</td>
<td>5.59-6.49</td>
<td></td>
</tr>
<tr>
<td>E₃₂</td>
<td>6.07</td>
<td>5.60-6.54</td>
<td></td>
</tr>
<tr>
<td>E₄₁</td>
<td>6.42</td>
<td>5.40-7.44</td>
<td></td>
</tr>
<tr>
<td>E₄₂</td>
<td>6.46</td>
<td>5.45-7.47</td>
<td></td>
</tr>
</tbody>
</table>
V. SUMMARY AND CONCLUSIONS

A. SUMMARY OF THE REPORT

The report assessing cultural resources for the Dickey/Lincoln School Transmission Project consists of five narrative chapters, a topical bibliography, and five appendices. Chapter I details the scope of work for the project, describes the project cultural resources team, the facility which the team represents and the institutional support available to us. The scope of work, together with the USDI guidelines for cultural resource survey (included in Appendix E), comprise an attitude and approach toward prehistory which is in accord with the current state of the art, not simply in terms of cultural resource management but also in terms of contemporary standards generally recognized by practitioners of anthropological archaeology. We comment on this only because we could not have made such a statement even a few years ago. The development of professional-level expectations by public agencies is to be applauded, for it means that applied research now has a broader relevance for archaeologists and the lay public alike.

Chapter II details our approaches to data collection. The approach to the identification of historic resources is straightforward, involving consultation with knowledgeable individuals, review of existing data files, and an extensive on-the-ground reconnaissance of those areas most likely to be impacted by transmission line construction. Identifying archaeological resources entails a more problematic approach because such resources occupy a temporal span some twenty times longer than the historic, and, moreover, such resources do not share the quality of
high visibility. Unlike historic resources, whose presence and location are easily predicted on the basis of current settlement patterns, archaeological sites are not so easily forecast. Lacking much detailed knowledge about the study area's prehistory, we resorted to a predictive model based more on general principles of human behavior. From this model, scale measures of environmental variability were developed and applied to half-mile square quadrats of the proposed transmission route. This provided a characterization of the study area against which a systematic sample of the quadrats was cast in order to ensure that our field sample would be representative. Judgemental samples also were taken in these areas with a high likelihood of containing sites.

Chapter III provides a link-by-link description of our inventory of sites within the study area. Chapter IV assesses the potential impacts to which the known cultural resources may be subject, and discusses appropriate mitigative actions to lessen such impact. In this latter chapter we also apply our predictive model as an estimator of impact potential for all parts of the study area, analyzing links, localized routing alternatives, and ultimately major routes in order to provide recommendations for a least-impact avenue for the transmission line to follow.

The topical bibliography is not exhaustive, our intent only being to provide a reasonably comprehensive list of the published resources used in our study. The bibliography and appendices provide the essential baseline for what is currently known about cultural resources in the study area. Appendix A inventories the known sites of possible cultural significance which may be impacted by line construction. Appendices B and C provide summary overviews of the prehistory and history, respectively, of the northern
New England region. Appendix D is a listing of individuals, in public agencies and in the private sector, who have a knowledge of, and concern with, the cultural resources of the region. This listing should not be considered exhaustive, nor should it be construed to mean that we were able to contact each individual noted. Finally, Appendix E contains USDI documents, referred to in the body of the report, which were relevant to the framing of our approach to cultural resource assessment.

B. CONCLUSIONS AND RECOMMENDATIONS

One fact is immediately apparent from the route comparisons in Chapters III and IV: on the basis of known cultural resources and predicted potential impact alone, we have difficulty in providing a least-impact route recommendation. In terms of just the known sites, we usually find that if one route contains cultural material, its alternative(s) also will contain sites.

It would not be responsible practice to play a simple numbers game in making a recommendation, by saying in effect, that a lesser impact will result from following a route with fewer known sites. Qualitative assessments must be given equal weight, but this is a difficult task given the broad area the study covers and the variable quality of resources inventoried by state surveys. We do find, however, that gauging by age and prior impact, most sets of route alternatives are qualitatively and quantitatively equivalent in terms of potential impact.

Similar problems exist with the theoretic approach to predictive impact. Dealing with arbitrarily delimited ranges of variation in the environment, instead of discrete point-data, is useful at the quadrat level, but when link
comparisons must be made, the summary measures tend to regress toward the population mean. Moreover, it seems to be the case that alternative links tend to fall within highly similar environmental situations, yielding similar summary measures. The result is that we find it difficult to identify significant differences between or among alternatives. Even in those cases where we are able to state a preference, most recommendations must be qualified as marginally preferrable. Therefore, we must conclude that our objective measures, for reasons discussed, do not effectively distinguish a series of links that, when conjoined, comprise a least-impact route.

This must not be construed as a statement to the effect that, from the perspective of cultural resource managers, we have no concern with which route is ultimately selected by the USDI project team. We emphasize that any route will impact, to one degree or another, some cultural resources, and also that these impacts can be reduced through available mitigative actions.

Aside from objective determinations, our time spent in the field left us with subjective impressions about a number of locales, and we feel that these impressions warrant a refinement of preliminary conclusions in a few cases. For instance, the line will span the Connecticut and Winooski Rivers in areas that appear to be suitable for prehistoric occupation. Since such river crossings cannot be avoided, we cannot recommend alternatives, but we do note these as high sensitivity zones where special care must be taken in the later project phases. Another area of great concern is the locale of Peacham, Vermont, contained within Link 43. This community is rich in history, a statement that applies to most settlements in the study area, but Peacham is located away from major highways,
has not fallen prey to modernization and development, and hence retains its integrity and a character reflective of eras past. Many of the community's original buildings are still standing and in good condition, such as Elkin's Tavern which was constructed in 1787. While the proposed line actually encroaches on few population clusters other than Peacham, none of these has maintained its contextual integrity. An example of such a community is Whitefield, New Hampshire. While the town square vicinity contains many structures with possible historic significance, a major substation exists on the outskirts of town. The addition of another line adjacent and parallel to existing facilities would not be deemed intrusive in light of this prior impact. Given these circumstances, we strongly recommend avoidance of Link 43 (containing Peacham) in favor of alternative Link 44.

Table 14 depicts our recommended, least-impact route, with comments explaining our preferences. In making judgements, we have used our objective measures (route summary values), subjective impressions, and in some cases, individual link comparisons.
### TABLE 14

**PREFERRED TRANSMISSION ROUTE**

<table>
<thead>
<tr>
<th>Segment</th>
<th>Preferred Route</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A-1</td>
<td>The primary distinction between alternatives involves use of Link 1 or Link 2 (Table 11). While we can measure no significant difference between routes (Table 12), there does exist a significant difference between Links (Table 10), with Link 1, hence Route A-1, being the preferred alternative.</td>
</tr>
<tr>
<td>B</td>
<td>B₂₋₁</td>
<td>Based strictly on objective measures (Table 13), Route B₂₋₁ has the lowest summary value (indicating least potential impact) as well as a measure of dispersion indicating that the environment within this route has a low variability index. However, measures for the other alternatives do not differ greatly, so this preference must be qualified as marginal; depending on other factors, any route is deemed acceptable.</td>
</tr>
<tr>
<td>C</td>
<td>Any</td>
<td>Segment C is one of the longest, with more links, than any other we must consider. Given that major link differences (e.g., 11 vs. 12) are nearly equivalent and that subjective criteria do not apply well to the interior upland location of these alternatives we deem any route acceptable.</td>
</tr>
<tr>
<td>D</td>
<td>D₁</td>
<td>The primary difference between alternatives is the use of Link 43 or Link 44 (Table 11). For reasons discussed, Route D₁ is strongly preferred.</td>
</tr>
<tr>
<td>E</td>
<td>E₂₋₄</td>
<td>Among all alternatives, the E-2's are the only ones with significant differences from the others, i.e. the E-1's and E-4's are marginally preferred over the E-3's (Table 13). The primary difference between E-2A and E-2B is in the use of Link 55 or Link 56 (Table 11). Link 55, hence Route E-2A, is marginally preferred.</td>
</tr>
</tbody>
</table>
C. FURTHER COMMENTS AND RECOMMENDATIONS

1. Unavoidable Impacts

If this line is constructed, there will be unavoidable intrusion impact on the visual field at regional and local levels. This indirect impact was discussed in Chapter IV and in the companion report prepared by Comitta Frederick Associates. While most sections of the line have suffered prior impact, thus limiting the adverse effect of proposed construction, several areas (particularly Link 43 in the vicinity of Peacham) would have unavoidable adverse impact at the local and regional level. Direct impacts on resources are capable of effective mitigation.

2. Long-term Productivity

The concept of "long-term productivity" is somewhat difficult to relate to cultural and historical resources, as the current state of our art deals little with the concept of "productivity". In the sense of the research and interpretive value of the resource, the avoidance of direct impact will preserve productivity. In the sense of the visual integrity of the immediate environment of historic and cultural resources, productivity could be related to the overall visual attractiveness of the region for tourist purposes. However, this matter is best handled as a sub-set of economic and visual impact, rather than as an integral aspect of cultural and historic resources. From our perspective, the proposed construction will have no local short-term increase in productivity (in the senses discussed above) and may reduce the long term productivity as measured by interpretive potential.

3. Irreversible and Irretrievable Resource Commitment

The only irreversible and irretrievable commitment of cultural and historical resources which would result from this proposed construction would be the result of any excavation of archaeological resources which could not be avoided in a reasonable and cost-effective manner by re-routing or re-design. This statement
presumes that excavation is a use and commitment of resources, albeit as data recovery. When compared with destruction, an effective data-recovery program may be regarded as a wise use of the resource, to the extent that appropriate techniques are used to recover a maximum of the potential archaeological data available.
4. **Alternative Management**

Having summarized our findings, the potential impact, preferred routings, and overall mitigation strategies, the following is a consideration of alternate applied research and management procedures, ranging from no further work to additional full survey of the region through which the facilities pass.

a. **No further work.** This alternative presumes that all steps necessary have been taken and that no further assessment or mitigation is necessary. Since resources have been discovered, but not adequately evaluated or subjected to specific planned mitigation, this recommendation cannot be supported.

b. **No further survey or assessment, but monitoring of construction.**
This recommendation might be supportable if only archaeological resources were threatened and a full and intensive right of way survey had been completed and the resources avoided. Since this is not the case, this recommendation cannot be supported.

Full and complete intensive survey of all right of way and construction zones. Because cultural resources have been encountered within the 1/4-mile route width considered in this study and because the likelihood of finding additional resources in close proximity to the facilities location has been demonstrated, we recommend that a full and complete intensive survey of historic and prehistoric resources be undertaken as part of the final engineering design phase of project planning.
d. Full and complete intensive route survey to plan facilities sitting within the preferred routing. While our research was concentrated within the 1-mile route, the impact of construction on the viewshed of historic properties was also considered in other studies. Further assessment and facilities location could be more easily accomplished in a right of way survey, as recommended above. It would probably not be cost-effective to repeat a survey of broader scope than necessary, in particular at this point in the planning process.

e. Regional Survey. In certain circumstances, it would be desirable to conduct an intensive field survey of the region surrounding the project area, in order to assess the relative significance of the project area's resources compared to those which surround it. This approach would particularly apply to those circumstances where mitigation decisions might rest on the relative uniqueness of certain resources or their relative integrity. Because of the general sparseness of prehistoric resources and because the historic background is readily available, we do not believe that the nature of this project justifies a study of such a larger scope.

Having stated our routing preferences and impact assessments, we recommend further study to mitigate the potential impact on cultural resources, following selection of routing alternates and facilities locations. We reiterate our recommendation that efforts be continued to devise an operational model for
resource locations during subsequent studies, in hopes that our efforts at resource protection may also contribute to the understanding of past land-use patterns in this area and to the more efficient and effective management of cultural resources.
CHAPTER VI
REFERENCES
PREDICTIVE MODELS FOR SITE LOCATIONS AND CHARACTERISTICS: METHODS AND TECHNIQUES

Banfield, A.W.F.

Banton, Michael, ed.

Benchley, Elizabeth

Bennett, J.W.

Berry, B.J.L. and D. Marble, eds.

Binford, Lewis R.

Blouet, B.W.

Brose, David S.

Campbell, John M.
Chisholm, Michael

Chorley, R.J. and P. Haggett, eds.

Clarke, David L.
1968 Analytical Archaeology. London: Methuen and Co., Ltd.

Cochran, William G.

Cook, J.P. and W.J. Stringer

Dale, M.B.

Davidson, D.A.

Dice, L.R.

Dincauze, Dena and Judith Meyer

Donaldson, B.R.

Farnsworth, Kenneth B.
Fitting, James E.  
1965  Observations on Paleo-Indian Adaptive and Settlement Patterns.  

1970  The Archaeology of Michigan, A Guide to the Prehistory of the  
Great Lakes Region.  Garden City: Natural History Press.  

Flannery, Kent V., ed.  

1976b  Linear Stream Patterns and Riverside Settlement Rules.  In The  
Early Mesoamerican Village, by Kent V. Flannery, ed.  New York:  

Gould, Peter R.  
Paper No. 4.  

Gumerman, G.J., ed.  
1971  The Distribution of Prehistoric Population Aggregates.  Prescott  
College Anthropological Papers, 1.  

Gumerman, George L. and Thomas R. Lyons  
1971  Archaeological Methodology and Remote Sensing.  Science  
172:126-132.  

Hagerstrand, T.  
1967  Innovation Diffusion as a Spatial Process.  (Trans. by A. Pred)  
Chicago: University of Chicago Press.  

Haggett, Peter  
1966  Locational Analysis in Human Geography.  New York: St. Martin's  
Press.  

Haggett, Peter, R.J. Chorley and D.R. Stoddart  
1965  Scale Standards in Geographical Research: A New Measure of  
Areal Magnitude. Nature 206(4974); 844-847.  

Hamilton, H.R. et al.  
1969  Systems Simulation for Regional Analysis An Application to River-  

Hammond, Robert and Patrick McCullagh  
1974  Quantitative Techniques in Geography: An Introduction. Oxford:  
Clarendon Press.
Harp, Elmer E., Jr.


Harvey, David W.

1969 Explanation in Geography. London: Edward Arnold.

Hession, Edward


Hodder, Ian and Clive Orton

Holmes, John

Horton, R.E.
Howe, Frank B.  
1935  
Classification and Agricultural Value of New York Soils. Cornell University Agricultural Experiment Station Bulletin #619. Ithaca.

Hudson, John C.  
1969  

Jarman, M.R., C. Vita-Finzi and E.S. Higgs  
1972  

Jochim, Michael A.  
1976  

Johnson, Gregory A.  
1972  

Judge, W. James, and James I. Ebert and Robert K. Hitchcock  
1975  

Keel, Bennie C. et al.  
1976  
An Archaeological Reconnaissance of East Fork Lake, Ohio. Reports in Anthropology, No. 5. Laboratory of Anthropology. Wright State University. Dayton, Ohio.

Klein, Joel I.  
1973  

Layton, R.  
1972  

Lovis, William A.  
1976  

Lull, Howard W.  
1968  
Lyons, Thomas R. and Robert K. Hitchcock, eds.  

MacArthur, Robert H.  

MacDonald, George F.  

Martijn, Charles A. and Edward S. Rogers  

Martin, R.D.  

Matson, Richard G. and William D. Lipe  

McLeod, John, ed.  

McManamon, Frank P.  

Morrill, Richard L.  

Mueller, James W.  

Munson, Patrick J. and Alan D. Harn

Neudorfer, Giovanna

Pelto, Pertti J.

Plog, Fred T.

Plog, Fred and J.N. Hill

Plog, Stephen

Pred, A.
1967 Behavior and Location. Land Studies in Geography, No. 27B.

Rapport, David J. and James E. Turner

Read, Dwight W.

Redman, Charles L.
Renfrew, Colin, ed.

Reynolds, Robert G.D.

Rinker, Jack N.

Ritchie, William A.

Ritchie, William A. and Robert E. Funk

Rogers, A.

Roper, Donna C.

Russell, Clifford, S., ed.

Schiffer, Michael B.

Shelford, Victor E.

Simon, H.A.
Siegel, Sidney  

Snow, Dean R.  

Sopher, David E.  

Steward, Julian H.  

Stoltenberg, Carl, Kenneth Ware, Robert Marty, Robert Wray, and J. Wellons  

Struwever, Stuart  

Thomas, D.H.  

Tringham, R.  

Turnbaugh, William A.  
Turnbaugh, William A.

Vogt, E.Z., ed.

Vogt, E.Z. and E.M. Albert, eds.

Wallis, W. Allen and Harry V. Roberts

Wauchope, Robert, ed.

Way, Douglas S.

Weide, David L. and Margaret L. Weide

Western, D and T. Dunne

Westveld, Marinus et al.

Williams, B.J.

Winters, Howard D.
Woodall, J. Ned

Wright, H.E.

Yarnell, Robert A.

Yellen, J. and H. Harpending
PREHISTORY

Baird, S.F.

Bailey, John H.


Basa, Louise

Bolian, Charles E.

Bolton, R.P.

Borns, Harold W., Jr.

Bourque, Bruce J.


Bradley W.H.

Braun, David P.

Brennan, Louis A.
Burger, Valerie

Byers, Douglas S.

Byers D.S. and W.S. Hadlock

Caldwell, Joseph R.

Camp, Helen

Carson, J.A.

Cooper, J.M.

Crane, H.R.

Curran, Mary Lou and Dena F. Dincauze

Day, Gordon M.

Dincauze, Dena
Dixon, Ronald B.

Dragoo, Don W.

Drake, Samuel G.
1855  Indian Captivities. NY: Derby and Miller

Eggan, Fred

Erskine, J.S.

Fischel, Hans E.

Fitting James A.

Fitzhugh, William W. (ed.)

Flannery R.

Fowler, William S.

Funk, Robert E.

Girovard, Laurent

Griffin, J.B. (ed.)

Grossinger, Richard

Hadlock W.S.
Hadlock, W.S. and D.S. Byers  

Hadlock, W.S. and T. Stern  

Hall, Benjamin  
1858  History of Eastern Vermont.

Hallowell, A.L.  

Harp, Elmer, Jr.  


Haviland, William A.  


Haynes, Henry W.  

Haynes, C. Vance, Jr.  

Hindsdale, Clark  

Holt, Mable Rogers  

Howard, Edgar B.  
Hucksoll, Aurelia C.
1967 Watercourses and Indian Populations in the Northeast Kingdom. Vermont Academy of Arts and Sciences O.P. 2.

Huden, John C.

Johnson, Frederick
1940 The Indians of New Hampshire, Appalachia 6:7.

Jordan, Douglas F.

Kilbourne, Frederick Wilkinson

Kingsbury, I.W. and W.S. Hadlock

Lee, Thomas E.

Loring, Stephen
1972 An Appraisal of Vermont Archaeology on file State Archaeology Office.

Lowther, Gordon
MacDonald, George F.

McIntosh, Lillian Dolbier

Maine Historical Society

Marshall, Harlan A.

Martijn, Charles A. and Edward S. Rogers
1969 Mistassini-Albanel, Contributions to the Prehistory of Quebec. Travaux Divers No. 25, Centre d'Etudes Nordiques, Universite Laval, Quebec.

Mechling, W.H.

Mercer, Henry Chapman

Merrill, George Drew

Moorehead, W.K.

Perkins, G.H.
1905-06 Prehistoric Vermont, Evidences of Early Occupation by Indian Tribes. Vermont Historical Society Proceedings.
Powers, Grant

Price, Chester, B.


Ray, Roger B.

Raymond, William Odber

Ritchie, W.A.


Ritchie, William A. and R. E. Funk

Robert Abbe Museum

Rogers, E.S. and R.A. Bradley

Rogers, E.S. and M.H. Rogers


Rowe, J.H.

Salwen, Bert
Salwen, Bert

Sanger, David

Sanger, David and Robert G. MacKay

Sanger, David, R. Davis, R. Mackay and H. Borns
Sargent, H.R.
1954 An Archaeological Survey of New Hampshire. Submitted for Publi-
cation in Papers of the Robert S. Peabody Foundation for
Archaeology. Manuscript on file.

n.d. A Guidebook on Field Archaeology. University of New Hampshire
Library.

Sherman, Theodor H.

Siccama, Thomas G.
1971 Presettlement and Present Forest Vegetation in Northern Vermont
with Special Reference to Crittenden County. American Midland
Naturalist 85:153-162.

Smith, B.L.
1948 An Analysis of the Maine Cemetery Complex. Bulletin of the
Massachusetts Archaeological Society 9:17-72.

Smith, Nicholas N.

Smith, Walter B.
Park Museum; No. 2. Bar Harbor.

Snow, Dean R.
1968 Wabanaki 'family hunting territories'. American Anthropologist
70(6):1143-1151.

1969 A Summary of Prehistoric Sites in the State of Maine. Restricted
Publication by the Department of Anthropology, University of
Maine. Orono.

1969 A Summary of Excavations at the Hathaway Site in Passadumkeag,
University of Maine, Orono.

Indian Island, Old Town, Maine. Mimeographed. Department of
Anthropology. State University of New York at Albany.

1970 A Middle Woodland Site on the Coast of Maine. Bulletin of the

1972 Rising Sea Level and Prehistoric Cultural Ecology in Northern
Snow, Dean R.


Soule, William H. ed,

Speare, Eva A.

Speck, Frank G.


Speck, F. and W. Hadlock

Speck, Frank E. and R.W. Dexter


Starbird, Charles M.

Storck, Peter L.

Strong, W.D.

Taylor, Hugh A.
Taylor, William E. jr.  

Trigger, Bruce G.  

Turnbull, Christopher J.  

Tyzzer, E.E.  

United States Corp of Engineers  

Vogelman, Thomas  


Wallis, W.D. and R.S. Wallis  


Whipple, Chandler  

Wight, D.B.  
1967   The Androscoggin River Valley Gateway to the White Mountains. Charles E. Tuttle, Rutland.

Willey, Benjamin Glazier  

Willey, Gordon R.  
Willoughby, C.C.

Wintemberg, W.J.

Woodrow, Arthur D.
1928 Metallak: The Last of the Cooashankes. Rumford, Rumford.

Young, William R., ed.
HISTORY AND ETHNOHISTORY

Abbot, John S.

Aldrich, P.E.
1878 Massachusetts and Maine; Their Separation. Hamilton, Worcester.

Alger, A.L.
1897 In Indian Tents. Boston.

Allagash Historical Society

Allen, Ira

Allen, William
1849 The History of Norridgewock.

Anonymous
1864 Centennial Celebration of the Settlement of the Town of Lancaster, New Hampshire.

Bacon, George F.

Bagley, Marion M.

Bailey, Joseph Whitman

Bailey, William

Baker, George W.
Baker, William A.

Banks, C.E.
1885 The Early Settlements in Maine Prior to 1620. Maine Historical and Genealogical Records 2:207-216.

Banks, Ronald F.

Bartlett, John H.

Baxter, J.P.

Beird, Frank A.

Beckley, Hosa
1846 The History of Vermont. Salisbury, Brattleboro.

Beers, F.W.
Beers, F.W.  

Belknap, Jeremy  

Bent, Frank R.  

Benton, Everett C.  

Bidwell, Percy W. and John I. Falconer  

Billias, George A.  
1959  The Massachusetts Land Bankers of 1740. Orono, Me.: University Press.  

Biondi, Arnold S. and F.W. Lymen  

Bliss, C.B.  
1923  Barnett History Pictures. McIndoe Falls.  

Blum, Jerome  

Bogart, O.L.  
1948  Peacham, the Story of a Vermont Hill Town. Vermont Historical Society, Montpelier.  

Bolton, R.P.  
1930  Indian Remains in Northern Vermont. Indian Notes, Museum of the American Indian, Heye Foundation 7:57-69.  

Brackett, James S.  

Brown, John M.  
1875  Coasting Voyages Made in the Gulf of Maine Made in the Years 1604-1606 by Samuel Champlain. Bath.
Brown, Mrs. W.W.


Brown, Roger Hamilton
1955 The Struggle for the Indian Stream Territory. Western Reserve University Press.

Browne, G.W.
1902 Indian Legends of Acadia. Acadiensis 2:54-64.

Buck, John E.
1933 Historical Map of Vermont. Buck, St. Albans.

Bunnell, Ellsworth
1971 Even to this Valley. Harlo, Detroit.

Burns, Lillian A.
1975 Mountain Measures. Whitefield, N.H.

Burrage, Henry S., ed.


Butler, Eva L. and W.S. Hadlock


Butler, L.C.
The Memorial History of Essex, Vermont. Styles, Burlington.

Buxton, Henry
Pioneers of Eastern Maine.

Carlisle, L.B.
Carlisle, L.B.  
1974 Look Around Richmond, Butler, and Huntington, Vermont. Chittenden County Historical Society.

Carpenter, William H.  

Carter, Robert M.  

Chadbourne, Iva H.  
1957 Maine Place Names. Wheelwright, Freeport.

Chamberlain, A.F.  
1902 The Primitive Life of the Waparaki Women. Acadiensis, 75-86.


Chamberlain, Joshua L.  
1877 Maine: Her Place in History.

Biggar, H.P.  

Chapin, J.  
1910 Middlesex As She Is. Vermonter 15:201-209.

Charlotte, Lenetine M.  

Charter of Chiswich  
1764 Grant to James Avery 17 Nov. 1764.

Charter of Dummer  
1773 Granted by Governor John Wentworth.

Chase, Francis  
1856 Gathered Sketches from the Early History of New Hampshire and Vermont. Tracy, Kenney and Co., Claremont.

Chase, P.F.  
Child, Hamilton
1886 Gazetteer of Grafton County, New Hampshire. Syracuse.
1887 Gazetteer of Caledonia and Essex Counties, Vermont, 1764-1887. Syracuse.
1889 Gazetteer of Washington County, Vermont, 1783-1889. Syracuse.

Chittenden County Historical Society
1965 Bulletin.

Chittenden Bicentennial Committee

Church, Benjamin

Citizens for Historic Preservation

Clark, Charles E.

Clarke, Dorothy L.
1939 Historical Map of Vermont. The Baron Bonny Co., Bradford.

Clifford, Harold B.
1963 Maine and Her People. Wheelwright, Freeport.

Coatsworth, Elizabeth
<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Title</th>
<th>Publisher/Location</th>
</tr>
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<tr>
<td></td>
<td>1883</td>
<td>Atlas of Somerset County, Maine.</td>
<td></td>
</tr>
<tr>
<td>Conant, Edward</td>
<td>1890</td>
<td>Geography, History and Civil Government of Vermont. Tuttle, Rutland.</td>
<td></td>
</tr>
<tr>
<td>Coolidge, A.J.</td>
<td>1860</td>
<td>History and Description of New England, Coolidge, Boston.</td>
<td></td>
</tr>
</tbody>
</table>
Crane, Jonas R.

Crockett, Walter H.

Cutler, James M.

Cummings, Abbott L., ed.

Curtis, N., ed.
1907 The Indian's Book. New York.

Cutler, James M.
1976 The Village Cemetery, Essex Junction, Vermont.

Daniels, Walter M.

Davis, G.A.
1907 History of Cumberland County, 1867-1891, Vol. 5.

Davis, W. Raymond

Day, Gordon M.


Deming, E.W.
Dexter, H.M.  

Denys, Nicolas  
1908 Description and Natural History of the Coasts of North America (Acadia). Ed. by W. Ganong, Toronto.

Dietz, Law  

Dixon, R.B.  

Dodge, Levi, W.  

Downey, F.  

Drake, Samuel A.  

Duane, James  

Duffus, Robert Luthur  

Dummer Bicentennial Commission  

Eastman, F.S.  

Eckstrom, F.H.  

Eckstrom, F.H.

1941 Indian Place Names of the Penobscot Valley and the Maine Coast. Orono, Me: University Press.


Eliot, L.H.
1880 Orange County Conferences. Randolph.

1974 Errol Bicentennial History Committee
Errol on the Androscoggin, 1774-1974.

Essex Centennial
1883 Essex Centennial, 1773-1883. Argus, Montpelier.

Evans, George C.

Evans, George H.

1929 Farmer, John

Fassett, James H.

Fernald, Peggy and A.N. Wellman

Fisher, Dorothea F.
1933 Vermont Tradition, The Biography of an Outlook on Life. Little and Brown, Boston.

Fobes, Charles B.

Franklin County Edition
Friss, Herman R.  
1940  

Frost, H.K.  
1912  

Frost, John E.  
1974  

Fuller, Edmund  
1952  

Gelpin, Wallace  
1950  

Gifford, William Herbert  
1970  
Colebrook. The News and Sentinel, Inc. Colebrook, N.H.

Godfrey, J.E.  
1876  

Greven, Phillip J.  
1970  

Grover, Archer L.  
1942  
Chronological Charts of Events in and Connected with the Province of Maine.

Hall, Benjamin  
1858  
History of Eastern Vermont.

Hall, Samuel R.  
1868  
The Geography and History of Vermont. Willard, Montpelier.

Hammond, Isaac, W.  

Hammond, Otis G.  
1916  
Masen Title and Its Relations to New Hampshire and Vermont. Worcester.

1971  
<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Year</th>
<th>Publisher/Location</th>
</tr>
</thead>
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<tr>
<td>Hanson, J.W.</td>
<td>History of the Old Towns.</td>
<td>1849</td>
<td></td>
</tr>
<tr>
<td>Harris, C.E.</td>
<td>A Vermont Village, Waterford, Vermont. Register Press, Yarmouth Port.</td>
<td>1941</td>
<td></td>
</tr>
<tr>
<td>Hayes, Lyman S.</td>
<td>Connecticut River Valley in Southern Vermont and New Hampshire.</td>
<td>1929</td>
<td></td>
</tr>
<tr>
<td>Hayward, John</td>
<td>A Gazetteer of New Hampshire. Jewell, Boston.</td>
<td>1849</td>
<td></td>
</tr>
<tr>
<td>Heaton, John L.</td>
<td>The Story of Vermont. Lothrop Company, Boston.</td>
<td>1889</td>
<td></td>
</tr>
<tr>
<td>Hemmenway, Abby M.</td>
<td>The Vermont Historical Gazetteer, published by author, Burlington, Vermont.</td>
<td>1871</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Caledonia County, Vermont. Vermont Historical Gazetteer, 1867-1891, Vol. 1.</td>
<td>1891</td>
<td></td>
</tr>
</tbody>
</table>
Hemmenway, A.M.
1891 Orange County, Vermont. Vermont Historical Gazetteer, 1867-1891, Vol. 2.
1891 Chittenden County, Vermont. Historical Gazetteer, 1867-1891, Vol. 3.
1891 Middlesex, Vermont. Historical Gazetteer, 1867-1891, 4:222-250.

Higginson, Thomas W.
American Explorers.

Hill, Christopher

Hill, Ralph N.

Historic American Buildings Survey

Historical Records Survey
1939 Inventory of Town and City Archives #4. Portland.

Hoffman, Bernard G.
1961 Cabot to Cartier: Sources for a Historical Ethnography of Northeastern North America 1497-1550. Toronto: University of Toronto Press.

Hoskins, Nathan
1831 A History of the State of Vermont. Shield, Vergennes.
Howard, R.H.

Howe, Joseph D.

Hubbard,
Map of Northern Maine, 1879-1929.

Humelhoch, Myra

Hunt, Elmer M.

Huston, John J. and C. Schwenker

Hutchinson, Anne

Jackman Bicentennial Book Committee

Jackson, J. Robert, ed.
1905 History of Littleton, New Hampshire.

Jeffrey, W.H.
1904 Successful Vermonters, A Modern Gazetteer of Caledonia.
Burke.


Jenness, John S.
1878 Notes on Piscataqua Patents. Portsmouth.

Jericho Historical Society
Jesuit Relations and Allied Documents  

Johnson, Frances A.  

Jones, Matt Bushnell  

Jones, Page Helm  

Jordan, William B.  

Josselyn, John  

Kelley, Jerome  

Kidder, Frederic  

Kilbourne, Frederick Wilkinson  

Kimball, J. Wendell  
1947 Early Settlers of Lancaster, New Hampshire, D.A.R.

King, M.F.  

1844 Washington County, Vermont.

Lakeway, Mildred C.  
Lamb, Wallace E.

Lancaster Bicentennial Committee

Lancaster Sesquicentennial Committee
1914 One Hundred and Fiftieth Anniversary of Lancaster, New Hampshire.

Landon, Sealand W.

Leach, Douglas E.

Leane, John J.

Leavitt, Richard F.
1970 Colebrook Yesterday.


LeClercq, Chrestien Foyher

Lee, John Parker
1926 Uncommon Vermont. Tuttle, Rutland.

Lescarbot, Marc
1914 The History of New France...With an English Translation, Notes and Appendices by W.L. Grant. . .and an Intro by H.P. Biggar. In three Volumes, Volume III. The Champlain Society, Vol. XI, Toronto.

Lewis, Theodore G.
<table>
<thead>
<tr>
<th>Author</th>
<th>Title</th>
<th>Location/Publisher</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loring, Amasa</td>
<td>History of Piscataquis County Maine from Its Earliest Settlement to 1880.</td>
<td>Hoyt, Fogg, and Donham, Portland.</td>
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<td>Lowell, Mary Chandler</td>
<td>Papers = Wet Towns and Families in Piscataquis County.</td>
<td></td>
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<tr>
<td>Luzader, John</td>
<td>Decision on the Hudson, the Saratoga Campaign of 1777. National Park Service, Washington, D.C.</td>
<td></td>
</tr>
<tr>
<td>Main, Jackson T.</td>
<td>The Social Structure of Revolutionary America. Princeton University Press, Princeton, N.J.</td>
<td></td>
</tr>
<tr>
<td>Maine Historical Sketches</td>
<td>Machias and the First Naval Battle of the Revolution.</td>
<td></td>
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<tr>
<td></td>
<td>Publications in Print. Portland.</td>
<td></td>
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<tr>
<td>Maine State Development Office</td>
<td>A Down East Experience, Maine Historic Memorials</td>
<td>1976</td>
</tr>
<tr>
<td>Maine Writers' Research Club</td>
<td>Maine Indians in History and Legends</td>
<td>1952</td>
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<tr>
<td>Maine, Chris</td>
<td>Moosehead Souvenir Booklet, 1776-1876-1976</td>
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<td>Malone, Dumas</td>
<td>Empire for Liberty</td>
<td>1960</td>
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<tr>
<td>Marshall, Gertrude W.</td>
<td>Indian Stream Republic and Indian Stream War - An Authentic Bit of New Hampshire History</td>
<td>1935</td>
</tr>
<tr>
<td>Matthews, Lois K.</td>
<td>The Expansion of New England</td>
<td>1909</td>
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<tr>
<td>Melvin, Charlotte L.</td>
<td>The Story of Aroostock, Maine's Last Front</td>
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<tr>
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<td>History of Coos County, New Hampshire</td>
<td>1888</td>
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<tr>
<td>Merrill, Georgia Drew, ed.</td>
<td>History of Androscoggin County, Maine</td>
<td>1891</td>
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<tr>
<td>Michaud, A.</td>
<td>An Acadian Heritage from the St. John River Valley</td>
<td>1972</td>
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<td>Moody, F. Kennon</td>
<td>The Williston Story</td>
<td>1961</td>
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<tr>
<td>Moody, Linwood W.</td>
<td>The Maine Two-Footers</td>
<td>1959</td>
</tr>
</tbody>
</table>
Morrissey, Brenda

New Hampshire Historical Society
1976      A Bicentennial Exhibition of the New Hampshire Historical
          Society, Concord.

New Hampshire, Microfilms
Published Colonial Records of the American Colonies. New Haven:
Research Publications, Microfilm 777.

New Hampshire Office of State Planning
1968      Inventory of Natural, Scenic, and Historic Areas in Coos
          County.

New Hampshire State Historical Commission
1974      New Hampshire Historical Markers. State Historical
          Commission, Concord.

Newton, Earle W.
1949      The Vermont Story; A History of the People of the Green Mountain
          State. Vermont Historical Society, Montpelier.

Northfield Bicentennial Committee
1976      Bicentennial Committee, Northfield in the Bicentennial Years.
          Northlight Press, Barre.

Northfield Town History Committee
1974      Green Mountain Heritage, the Chronicle of Northfield, Vermont.
          Pheonix, Canaan.

Nye, Mary G., ed.
1941      Sequestration, Confiscation, and Sale of Estates. Montpelier:
          State Papers of Vermont.

Orange County Historical Society
n.d.      Papers of Orange, Vermont, Box 129.

Osborn, William C.

Parker, Charles C.
1867      The Early History of Waterbury, Vermont. Waterbury.

Palfrey, John G.
1858-1890 History of New England. Little, Boston.
Perkins, Ida.

Pike, Robert E.

Pillsburg, H.

Piscataquis County Historical Society
1910 Historical Collections of County, Dover Observer Press, Dover.

Pitkin, Ozias C.
1941 History of Marshfield, Vermont.

Potter, Chandler E.

Powers, Grant

1880 Historical Sketches of the Coos County. Haverhill.

Pratson, Frederick J.
1970 Land of the Four Directions. Old Greenwich, Conn.: Chatham Press.

Pratt, Walter M.

Prescott, L.M.
History of Stratford. Newspaper Clippings.

Price, Chester B.

Rann, William S.
1886 History of Chittenden County Vermont. Mason, Syracuse.

Raymond, William Odber
1910 The River St. John, Its Physical Features, Legends and History from 1604 to 1784. J.A. Bowes, St. John, N.B.
Records, Ralph H.
1936 Land or A Basis for Economic and Social Discontent in Maine and Massachusetts to 1776. Unpublished Ph.D. Dissertation. University of Chicago.

Ring, Elizabeth

Robert, George S.

Robinson, R.E.

Roe and Calby, Pub.

Rogers, Lore A. and C.W. Scribner

Rogers, Patricia

Saltonstall, William G.
1941 Ports of Piscataque; Soundings in Maritime History of Portsmouth New Hampshire. Cambridge.

Sanborn, Edwin D.
1875 History of New Hampshire.

Sanborn, Franklin Benjamin

Sanborn Map and Publishing Company

Sanborn-Perius Map Company
1901 Whitefield, New Hampshire.
Sawtelle, William A.
1932 Historic Trails and Waterways of Maine, Maine Development
Commission, Augusta.

Scales, John
Oyster River Massacre. New Hampshire Historical Society
Proceedings 5:240-250.

Shove, Macworyl
1851 Two Months on the Tobique, New Brunswick: An Emigrants

Slocum, H.W.

Smith, David C.
Portland.

Press, Orono.

Smith, Edgar C.
n.d. Papers on History of Piscataquis County and Revolutionary
Soldiers.

Smith, Marion J.
1949 A History of Maine from Wilderness to Statehood. Falmouth,
Portland.


Snow, Nathaniel
1795 Map of Dalton, New Hampshire.

Somers, Amos N.
1899 History of Lancaster, New Hampshire.

Spaulding, John H.
1855 Historical Relics of the White Mountains. Noyes, Boston.

Speck, F.G.
1940 Penobscot Man. Philadelphia, University of Pennsylvania
Press.

Spencer, Wilbur Daniel
1973 Pioneers on Maine Rivers, with Lists to 1651. Baltimore:
<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Title</th>
<th>Publisher/Other Information</th>
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<td>The Orange Journal</td>
<td>The Orange Directory, Sept. 1, 1888.</td>
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<td>Thompson, Zaddock</td>
<td>History of Vermont.</td>
<td>Goodrich, Burlington.</td>
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<td>Tibbs, Thomas H.</td>
<td>Buckskin and Blanket Days.</td>
<td>Doubleday.</td>
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<td>True, N.C.</td>
<td>History of Rumford.</td>
<td></td>
<td></td>
</tr>
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<td>Trueman, Stuart</td>
<td>The Ordeal of John Gyles.</td>
<td>McClelland and Stewart Limited, Toronto.</td>
<td></td>
</tr>
</tbody>
</table>
Van de Water, Frederic F.
1946 Lake Champlain and Lake George. Bobbs and Merrill, Indianapolis.

Vaughan, Alden T.

Vermont Antiquarian

Vermont Division for Historic Preservation

Vermont Historical Records Survey

Vermont Historical Records Survey
n.d. Inventory of the Church Archives of Vermont. Montpelier.
1940 Inventory of the Town, Village, and City Archives of Vermont. Nos. 4, 7, 8, 10, 11, 13, 14. Montpelier.


Vermont Historical Society

Vetromile, T.

Vogelman, Thomas C.

Walbridge, John H.
1898 Whitefield, New Hampshire.

1901 Town of Slat, Northfield, Vermont. Jeffrey, East Burke.

Walker, Joseph B.

Walling, H.F.M.
1858  Map of Washington County, Vermont. New York.

Washington County Bicentennial Commission

Wasserman, Paul

Waterbury Historical Society
1973  Commemorative Book.

Waterbury Bicentennial Committee
1976  An Informal History of Waterford, Vermont.

Weeden, W. B.

Wells, Frederic P.

Wiggin, Edward

Wright, Denman D.
Wilgus, William J.
1945 The Role of Transportation in the Development of Vermont. Vermont Historical Society, Montpelier.

Wilkins, Martha Fifield

Willey, Benjamin B.
1856 Incidents in White Mountain History. Noyes, Boston.

Williams, Helen

Williams, Samuel
1809 The Natural and Civil History of Vermont. Mills, Burlington.

Williamson, Chilton

Williamson, William D.

Wilson, Charles M.
1937 Aroostock - Our Last Frontier. Daye.

Wilson, Granville P.
1918 Pioneers of the Magalloway from 1820 to 1904. Old Orchard, Maine.

Wissler, Clark
1966 Indians of the United States.

Wiswell, Everett

Wood, Richard G.

Woodbury, Carl V.
n.d. 1781-1931, One Hundred and Fifty Years of Northfield, Vermont.
Woodrow, Arthur D.

Wright, Walter W.

York, Vincent
CULTURAL RESOURCES MANAGEMENT

Agency of Development and Community Affairs
Division of Historic Preservation, Montpelier.

Agency of Environmental Conservation

Davis, Hester A.

Dincauze, Dena F. and J.W. Meyes

Lipe, William D.

McGimsey, Charles R.

McGimsey, Charles R. and H.A. Davis

Maine Historic Preservation Commission

Maine State Planning Office

National Archives of the United States

Office of State Planning

New Hampshire Department of Resources and Economic Development
1965 Coos County, New Hampshire Comprehensive Plan.

New Hampshire State Historical Commission
1974 New Hampshire Historical Markers
O'Neill, R.V.


United States Department of Interior


1977b Mitigation Measures. Washington, D.C.


United States Department of Interior and United States Department of Agriculture


Vermont Land Capability Plan

1972 Unique or Fragile Areas, Essex, Caldonia, Chittenden, Washington, Orange Counties.

Vermont State Planning Office


Washington Town Planning Commission

ENVIRONMENT AND GEOLOGY

Antevs, Ernst
1932 Alpine Zone of Mount Washington Range. Merrill and Webber, Auburn.


Beethan, Nellie and W.A. Niering

Billings, Marland P.
1968 Bedrock Geology of New Hampshire, Part II: Bedrock Geology, Department of Resources and Economic Development, Concord.

Borns, Harold W.

Bradstreet, T.E. and R.B. Davis

Butzer, Karl W.

Davis, Margaret
1969 Palynology and Environmental History During the Quaternary Period. American Scientist 57:317-322.

Davis, Ronald, T. Bradstreet, R. Stuckenrath, and H. Borns
1975 Vegetation and Associated Environments During the Past 14,000 Years near Moulton Pond, Maine. Quaternary Research 5:435-465.

Day, Gordon M.

Flint, Richard F.

Funk, Robert E.

Goldthwait, James W.
Goldthwait, James W., L. Goldthwait, and R.P. Goldthwait

Harp, Elmer, Jr.

Hartshorn, Joseph H.

Hatch, Norman L.

Hester, Jim J.

Lougee, Richard J.

Morison, Elizabeth F. and E.E. Morison

New Hampshire Department of Resources and Economic Development

Salwen, Bert

Shelford, Victor E.

Sicamma, Thomas G.
APPENDIX A

SITE INVENTORY:
DESCRIPTIONS AND PHOTOGRAPHS
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<td>01/2/1*</td>
<td>St. Francis, Me/5</td>
<td>Site 3</td>
<td>Indian burial ground and Jones mill located in plowed field at confluence of St. John's and St. Francis Rivers. St. Francis township, Aroostock County</td>
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<td>Dawn Nadeau</td>
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<td>01/3/2*</td>
<td>St. Francis, Me/5</td>
<td>Site 2</td>
<td>Xavier Cyr Mill. No structure, saw mill located at confluence of St. Francis River and Pentook (Thibideau) Creek. St. Francis township, Aroostock County.</td>
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<td>St. Francis, Me/5</td>
<td>Site 1</td>
<td>Villa d'Aigle house. Site of earliest house in St. Francis South bank of St. Francis River, St. Francis township, Aroostock County.</td>
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<td>Dawn Nadeau</td>
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<td>08/3/1*</td>
<td>ME 129-1</td>
<td>Penobscot Lake, Me/24, site 1</td>
<td>Gorge on waterline</td>
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<td>09/49/1*</td>
<td>ME 131-1</td>
<td>North East Carry, Me/26, Site 1</td>
<td>Portage/Moorehead Complex of artifacts</td>
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<td>18/7/1</td>
<td>Dixville, NH/45</td>
<td>Site 1</td>
<td>19th century round barn on secondary road south of NH Rt. 26, Columbia township, Coos County</td>
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<td>30/6/1</td>
<td>Errol, NH-Me/46</td>
<td>Site 1</td>
<td>Indian campsite reported at head of Akers Pond, Errol township, Coos County.</td>
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<td>State Library Errol Postmaster</td>
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<td>35/1/1*</td>
<td>Guildhall, VT-NH/52</td>
<td>Site 1</td>
<td>Fort Wentworth. Built by Rodgers' Rangers in 1755</td>
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<td>State Historic Preservation Officer</td>
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<td>35/4/2*</td>
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<td>Mid 18th century fort in plowed field north of Guildhall.</td>
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<td>Guildhall Postmaster</td>
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<td>19th century two story white frame house. At crossing between VT Rt. 102 and Link 35. Guildhall township, Essex County.</td>
<td>2</td>
<td>Beer's Atlas, 1878</td>
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<td>19th century two story white frame house at crossing between VT Rt. 102 and Link 35. Guildhall township, Essex County.</td>
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<td>Historic Site 1, Town of Guildhall Municipal Development Plan</td>
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<td>Former Central School</td>
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<td>Cellar Holes, between secondary roads, N.W. of Lunenburg, Essex County.</td>
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<td>Nellie Streeter</td>
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<td>37/1/1*</td>
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<td>Reported Indian camp</td>
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<td>Guildhall, VT-NH/52 Site 10</td>
<td>Benton House, built 1778. Guildhall, Essex County.</td>
<td>4</td>
<td>Project Historian</td>
</tr>
<tr>
<td>37/8/1</td>
<td></td>
<td>Whitefield, NH-VT/61 Site 6</td>
<td>19th century cemetery. Secondary road south of Lunenburg, Essex County.</td>
<td>24</td>
<td>grave markers</td>
</tr>
<tr>
<td>37/10/2</td>
<td></td>
<td>Whitefield, NH-VT/61 Site 9</td>
<td>19th century cemetery. At road crossing between secondary road S.W. of Lunenburg, Essex County,</td>
<td>25</td>
<td>grave markers</td>
</tr>
<tr>
<td>37/7/6*</td>
<td>Historic Resources, Lunenberg 3, Unique or Fragile Areas</td>
<td>Whitefield, NH/61 Site 5</td>
<td>Historic Site, Lunenberg, Essex County</td>
<td></td>
<td>Unique or Fragile Areas, Essex County 4 Vermont Land Capability Plan, 1972</td>
</tr>
<tr>
<td>37/8/7*</td>
<td>Historic Resources, Lunenberg Site 2 type. Site 8 Unique or Fragile Areas</td>
<td>Whitefield, NH/61 Site 8</td>
<td>Historic site, South Lunenberg, Essex County</td>
<td></td>
<td>Unique or Fragile Areas, Essex County 4 Vermont Land Capability Plan, 1972</td>
</tr>
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<td>37/8/8*</td>
<td>Historic Resources, Lunenberg Site Type I. Unique or Fragile Areas</td>
<td>Whitefield NY-VT/61 Site 10</td>
<td>Historic site, South Lunenberg, Essex County</td>
<td></td>
<td>Unique or Fragile Areas, Essex County 4 Vermont Land Capability Plan, 1972</td>
</tr>
<tr>
<td>38/8/1*</td>
<td></td>
<td>Whitefield, NH-VT/61 Site 3</td>
<td>Covered bridge, built 1862 Lancaster, Coos County.</td>
<td>5</td>
<td>Project Historian</td>
</tr>
<tr>
<td>38/8/2*</td>
<td></td>
<td>Whitefield, NH-VT/61 Site 4</td>
<td>Brickyard</td>
<td></td>
<td>Project Historian</td>
</tr>
<tr>
<td>Site #</td>
<td>Other Desig.</td>
<td>Quad. Ref. Map #</td>
<td>Description</td>
<td>Photo</td>
<td>Reference</td>
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<tr>
<td>38/18/3</td>
<td></td>
<td>Whitefield, NH-VT/61 Site 11</td>
<td>19th century houses Whitefield, Coos County.</td>
<td>6</td>
<td>Mr. Barn</td>
</tr>
<tr>
<td>38/18/4</td>
<td></td>
<td>Whitefield, NH-VT/61 Site 12</td>
<td>19th century house, red brick with frame addition Built 1823.</td>
<td></td>
<td>Citation on house</td>
</tr>
<tr>
<td>39/6/1</td>
<td></td>
<td>Littleton, NH-VT/60 Site 1</td>
<td>Early 19th century cemetery Littleton, Grafton County.</td>
<td>26</td>
<td>grave markers</td>
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<tr>
<td>40/1/1*</td>
<td>Littleton General Plan Report Type VI</td>
<td>Littleton, NH-VT/60 Site 2</td>
<td>1820 House, Route 135</td>
<td></td>
<td>General Plan Report, Littleton, NH, 1969.</td>
</tr>
<tr>
<td>42/2/1</td>
<td></td>
<td>Littleton, NH-VT/60 Site 3</td>
<td>Overlook cemetery, 19th century. Concord, Essex County</td>
<td>27</td>
<td>grave markers</td>
</tr>
<tr>
<td>42/7/1*</td>
<td>VT-CA-7</td>
<td>St. Johnsbury, VT-NH/59 Site 7</td>
<td>Unidentified archaeological site.</td>
<td></td>
<td>Vermont State Archaeological Survey</td>
</tr>
<tr>
<td>42/8/2</td>
<td>VT-CA-6</td>
<td>St. Johnsbury, VT-NH/59 Site 8</td>
<td>Small aboriginal campsite from Woodland Stage</td>
<td></td>
<td>Vermont State Archaeological Survey (VSAS)</td>
</tr>
<tr>
<td>42/8/3</td>
<td>VT-CA-5</td>
<td>St. Johnsbury, VT-NH/59 Site 9</td>
<td>Lithic workshop from Woodland Stage.</td>
<td></td>
<td>VSAS</td>
</tr>
<tr>
<td>43/5/1</td>
<td></td>
<td>St. Johnsbury, VT-NH/59 Site 3</td>
<td>19th century house, Peacham, Caledonia County.</td>
<td>7</td>
<td>Beer's Atlas, 1875</td>
</tr>
<tr>
<td>43/6/2</td>
<td></td>
<td>St. Johnsbury, VT-NH/59 Site 4</td>
<td>Elkins Tavern, built 1787, Peacham, Caledonia County.</td>
<td>8</td>
<td>Beer's Atlas, 1875</td>
</tr>
<tr>
<td>Site #</td>
<td>Other Desig.</td>
<td>Quad Ref. Map #</td>
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<td>Photo</td>
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<tr>
<td>43/6/3*</td>
<td>St. Johnsbury, VT-NH/59 Site 2</td>
<td></td>
<td>Blockhouse and stockade, Peacham, Caledonia County</td>
<td>29</td>
<td>Peacham Historical Society, Historic Tablet Marker.</td>
</tr>
<tr>
<td>43/7/4*</td>
<td>St. Johnsbury, VT-NH/59, Site 1</td>
<td></td>
<td>Peacham Academy, original structure built 1797. Peacham, Caledonia County.</td>
<td>9</td>
<td>L. Lamoureux, Peacham Town Clerk</td>
</tr>
<tr>
<td>43/7/5</td>
<td>St. Johnsbury VT-NH/59, Site 5</td>
<td></td>
<td>Standing Structure</td>
<td></td>
<td>Project Historian</td>
</tr>
<tr>
<td>43/8/6</td>
<td>St. Johnsbury, VT-NH/59, Site 6</td>
<td></td>
<td>Three adjacent 19th century houses, Peacham, Caledonia County.</td>
<td>10,11,12</td>
<td>Beer's Atlas, 1875</td>
</tr>
<tr>
<td>43/20/7</td>
<td>Plainfield, VT/58 Site 1</td>
<td></td>
<td>19th century farmhouse Washington County.</td>
<td></td>
<td>Beer's Atlas, 1873</td>
</tr>
<tr>
<td>43/21/8*</td>
<td>East Barre, VT/64 Site 1</td>
<td></td>
<td>19th century farmhouse Plainville, Washington County.</td>
<td>13</td>
<td>Project Historian</td>
</tr>
<tr>
<td>44/7/1</td>
<td>Woodsville, VT-NH/65 Site 1</td>
<td></td>
<td>Artifacts from Indian path which followed present Bailey/Hazen Road. Ryegate, Caledonia County.</td>
<td>28</td>
<td>Louis Lamoureux, Peacham Town Clerk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unexcavated remains of blockhouse. Ryegate, Caledonia County.</td>
<td></td>
<td>Redge White, Ryegate Town Clerk</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Artifacts from reported Indian Battlefield in plowed field.</td>
<td></td>
<td>Redge White, Ryegate Town Clerk</td>
</tr>
<tr>
<td>44/14/2</td>
<td>Woodsville, VT-NH/65 Site 4</td>
<td></td>
<td>19th century two story white frame house. Groton, Caledonia County.</td>
<td>14</td>
<td>Beer's Atlas, 1875</td>
</tr>
<tr>
<td>44/14/3</td>
<td>Woodsville, VT-NH/65 Site 3</td>
<td></td>
<td>19th century two story yellow frame house. Groton, Caledonia County.</td>
<td>15</td>
<td>Beer's Atlas, 1875</td>
</tr>
<tr>
<td>Site #</td>
<td>Other Desig.</td>
<td>Quad. Ref. Map #</td>
<td>Description</td>
<td>Photo</td>
<td>Reference</td>
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</tr>
<tr>
<td>44/10/4*</td>
<td>Historic Site Type 3, Unique or Fragile Resources, Caledonia County</td>
<td>Woodsville, VT-NH/65</td>
<td>Historic Site 3</td>
<td></td>
<td>Unique or Fragile Area, Caledonia County 4, Vermont Land Capability Plan, 1972.</td>
</tr>
<tr>
<td>44/26/4*</td>
<td></td>
<td>East Barre, VT/64 Site 2</td>
<td>19th century farmhouse, Washington County.</td>
<td></td>
<td>Project Historian</td>
</tr>
<tr>
<td>44/26/5*</td>
<td></td>
<td>East Barre, VT/64 Site 3</td>
<td>19th century two story farmhouse, Washington County.</td>
<td>16</td>
<td>Project Historian</td>
</tr>
<tr>
<td>44/26/6*</td>
<td>Historic Site 10, Washington Town Plan</td>
<td>East Barre, VT/64 Site 7</td>
<td>The Washington Creamery Washington, Orange County</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>44/26/7*</td>
<td>Historic Site 3, Washington Town Plan</td>
<td>East Barre, VT/64 Site 8</td>
<td>Catholic Church, built ca. 1890 by Quincy Calef as house.</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>44/26/8*</td>
<td>Historic Site 4a, Washington Town Plan</td>
<td>East Barre, VT/64 Site 9</td>
<td>The Washington House Stagecoach Stop</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>44/26/9*</td>
<td>Historic Site 2, Washington Town Plan</td>
<td>East Barre, VT/64 Site 10</td>
<td>Universalist Church built 1848</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>44/26/10*</td>
<td></td>
<td>East Barre, VT/64 Site 11</td>
<td>Baptist Church built before 1858</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>44/27/11*</td>
<td>Historic Site 4c, Washington Town Plan</td>
<td>East Barre, VT/64 Site 6</td>
<td>The E.P. Parker Hotel (northern hotel), Stagecoach Stop.</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>44/28/12</td>
<td>Cemetery 8, Washington Town Plan</td>
<td>East Barre, VT/64 Site 4</td>
<td>Downing Lot</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>Site #</td>
<td>Other Desig.</td>
<td>Quad Ref. Map #</td>
<td>Description</td>
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<tr>
<td>44/28/13</td>
<td>Historic site 8, Washington Town Plan</td>
<td>East Barre, VT/64</td>
<td>Joseph Calef Place (the Morin Place) built 1795</td>
<td></td>
<td>Proposed Town Plan for Washington, VT. 1973</td>
</tr>
<tr>
<td>46/4/1</td>
<td></td>
<td>Barre, VT/63</td>
<td>19th century two story yellow frame farmhouse, Barre, Washington County.</td>
<td></td>
<td>Beer's Atlas, 1873</td>
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<tr>
<td>46/5/2</td>
<td></td>
<td>Barre, VT/63</td>
<td>19th century farm complex.</td>
<td></td>
<td>Beer's Atlas, 1873</td>
</tr>
<tr>
<td>46/2/3</td>
<td>Historic site type 1, Barre, VT/63</td>
<td>Site 2</td>
<td>Historic site</td>
<td></td>
<td>Unique or Fragile Areas, Orange County 4, Vermont Land Capability Plan 1972.</td>
</tr>
<tr>
<td>46/2/4*</td>
<td>Historic Site Type 4, Barre, VT/63</td>
<td>Site 3</td>
<td>Historic site</td>
<td></td>
<td>Unique or Fragile Areas, Orange County 4, Vermont Land Capability Plan 1972.</td>
</tr>
<tr>
<td>46/4/5*</td>
<td>Historic Site Type 1h, Barre, VT/63</td>
<td>Site 4</td>
<td>Historic site</td>
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<td>Unique or Fragile Areas, Orange County 4, Vermont Land Capability Plan 1972.</td>
</tr>
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<td>46/4/6*</td>
<td>Historic Site Type 1, Barre, VT/63</td>
<td>Site 5</td>
<td>Historic site</td>
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<td>Unique or Fragile Areas, Orange County 4, Vermont Land Capability Plan 1972.</td>
</tr>
<tr>
<td>47/3/1</td>
<td>Montpelier, VT/57</td>
<td>Site 4</td>
<td>Round wooden silo, Berlin, Washington County</td>
<td></td>
<td>Beer's Atlas, 1873</td>
</tr>
<tr>
<td>47/3/2*</td>
<td>Montpelier, VT/57</td>
<td>Site 3</td>
<td>19th century brick framehouse, Berlin, Washington County.</td>
<td></td>
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</tr>
<tr>
<td>47A/1/1</td>
<td>Montpelier, VT/57</td>
<td>Site 2</td>
<td>19th century farmhouse, Mooretown, Washington County.</td>
<td></td>
<td>Beer's Atlas, 1873</td>
</tr>
<tr>
<td>47A/2/2</td>
<td>Montpelier, VT/57</td>
<td>Site 1</td>
<td>19th century farmhouse, Mooretown, Washington County.</td>
<td></td>
<td>Beer's Atlas, 1873</td>
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<td>Site #</td>
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<tr>
<td>48/3/1*</td>
<td>Historic Site Type 4h, Unique or Fragile Areas, Washington County</td>
<td>Camels Hump, VT/56 Site 10</td>
<td>Historic Site</td>
<td></td>
<td>Unique or Fragile Areas, Washington County 4, Vermont Land Capability Plan 1972</td>
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<td>Camels Hump, VT/56 Site 11</td>
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<td>Unique or Fragile Areas, Washington County 4, Vermont Land Capability Plan 1972</td>
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<td>Historic Site type 4h, Unique or Fragile Areas, Washington County</td>
<td>Camels Hump, VT/56 Site 12</td>
<td>Historic site</td>
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<td>Historic Site Type 4h, Unique or Fragile Areas, Washington County</td>
<td>Camels Hump, VT/56 Site 13</td>
<td>Historic Site</td>
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<td>48/2/5*</td>
<td>Historic Site Type 4h, Unique or Fragile Areas, Washington County</td>
<td>Camels Hump, VT/56 Site 14</td>
<td>Historic Site</td>
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<tr>
<td>49/1/1</td>
<td>VT-WA-2</td>
<td>Camels Hump, VT/56 Site 9</td>
<td>Bolton Falls Site: rock-shelter with Archaic, Woodland, Historic occupations, Washington County.</td>
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<td>VSAS</td>
</tr>
<tr>
<td>49/3/2</td>
<td>Vermont State Historic Site 0401-4</td>
<td>Camels Hump, VT/56 Site 8</td>
<td>Roederer, Chittenden County</td>
<td>68</td>
<td>Vermont State Historic Survey (VSHS)</td>
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<td>49/4/3</td>
<td>0401-3</td>
<td>Camels Hump, VT/56 Site 7</td>
<td>Callahan Place, Chittenden County</td>
<td>69</td>
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<td>49/4/4</td>
<td>0401-5</td>
<td>Camels Hump, VT/56</td>
<td>Tracey Place, Chittenden County</td>
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<td>Site #</td>
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<td>Quad Ref. Map #</td>
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<td>Photo</td>
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<td>49/7/5</td>
<td>0411-27</td>
<td>Camels Hump, Vt/56</td>
<td>Old Murray Farm</td>
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<td>Site 5</td>
<td>Machia Residence</td>
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<td>0411-29</td>
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<td>Hugo Residence</td>
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<td>0411-30</td>
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<td>Lavanway Residence</td>
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<td>0411-31</td>
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<td>Quinn's Store</td>
<td>64</td>
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<td>0411-32</td>
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<td>Jonesville bridge</td>
<td>62</td>
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<td>Chittenden County.</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>49/10/6*</td>
<td>0411-1</td>
<td>Camels Hump, Vt/56</td>
<td>North Main Street Historical District, Richmond, Chittenden County.</td>
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<td>56,57</td>
<td>VSHS</td>
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<td>58</td>
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<tr>
<td>49/10/7*</td>
<td>0411-3</td>
<td>Camels Hump, Vt/56</td>
<td>Albert Towne house, Chittenden County</td>
<td></td>
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<td>Site 3</td>
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<td>49/10/8*</td>
<td>0411-22</td>
<td>Camels Hump, Vt/56</td>
<td>Sunshine Farm, Chittenden County</td>
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<td>49/11/9*</td>
<td>0411-21</td>
<td>Camels Hump, Vt/56</td>
<td>Gleason Farm-Peet Residence, Chittenden County.</td>
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<td>49/11/10</td>
<td>0411-16</td>
<td>Burlington, Vt/55</td>
<td>Westfall Farm, Chittenden County</td>
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<td>Site 16</td>
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<td>Vermont State</td>
<td>Burlington, Vt/55</td>
<td>Route 20 bridge, Chittenden County</td>
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<td>Historic Site:</td>
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<td>49/12/12*</td>
<td>0411-7</td>
<td>Burlington, Vt/55</td>
<td>John Thompson house, Chittenden County.</td>
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<td>Site 14</td>
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<td>49/12/13*</td>
<td>0411-51</td>
<td>Burlington, Vt/55</td>
<td>Checkered house, Chittenden County.</td>
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<td>VSHS</td>
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<td>49/12/14*</td>
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<td>Martel Schoppe House, Chittenden County.</td>
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</table>

Unique or Fragile Areas, Chittenden County 4, Vermont Land Capability Plan 1972.
LINEAR FEATURES

Listed below are linear features, such as railroads and historic and aboriginal trails and roads, with possible historical significance. Given the linear nature of the features, as well as that of the transmission line, intersection is almost inevitable, and the cost of complete avoidance, in most cases, prohibitive. Since there would be no direct impact on these features, and since indirect impact would be no more, in effect, than a point on a line, we deem that construction, maintenance, and operation of the transmission line will have no adverse affect on the features.
<table>
<thead>
<tr>
<th>MAP #</th>
<th>QUAD</th>
<th>LINK-MILE</th>
<th>DESCRIPTION</th>
<th>REFERENCE</th>
<th>VIEWSHED/ROUTE</th>
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<tbody>
<tr>
<td>17</td>
<td>Churchill Lake, Me.</td>
<td>9-17</td>
<td>Timber railroad - on western shore of Chamberlain Lake, Piscataquis Co.</td>
<td>Project Historian</td>
<td>Viewshed</td>
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<tr>
<td>17</td>
<td>Churchill Lake, Me.</td>
<td>9-17-32</td>
<td>Eagle Lake and West Branch Railroad, Eagle Lake to Chesuncook Lake. 15 Miles abandoned track: An old logging railroad, this line connected Tramway on Eagle Lake with the northern end of Chesuncook Lake. A point of interest on this line is where 2 steam locomotives sit, abandoned with the line Piscataquis Co.</td>
<td>Project Historian</td>
<td>Viewshed</td>
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<tr>
<td>25</td>
<td>Seboomook Lake, Me.</td>
<td>9-49</td>
<td>Boyd and Harvey, narrow guage railroad. From Carry Pond to Carry Brook, Seboomook Township, Piscataquis Co.</td>
<td>Project Historian</td>
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<tr>
<td>43</td>
<td>Little Bigelow Mtn, Me.</td>
<td>12A-8</td>
<td>Boyd and Harvey, narrow guage railroad. From Carry Pond to Carry Brook, Seboomook Township, Piscataquis Co.</td>
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<td>Viewshed</td>
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<tr>
<td>26</td>
<td>North East Carry, Me.</td>
<td>9-46</td>
<td>Ox-drawn, wooden lumber railroad. Project Historian Viewshed Between head of Moosehead Lake and West Branch, Piscataquis Co.</td>
<td>Project Historian</td>
<td>Viewshed</td>
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<tr>
<td>28</td>
<td>Attean, Me.</td>
<td>11-21</td>
<td>International railroad of Maine. Currently in operation as Canadian and Pacific.</td>
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<td>29</td>
<td>Long Pond, Me.</td>
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<td>International railroad of Maine. Currently in operation as Canadian and Pacific.</td>
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<tr>
<td>23</td>
<td>Sandy Bay, Me.</td>
<td>8-8</td>
<td>Bald Mountain railroad. Jackson Abandoned RRs in to Sandy Bay, Somerset County. Maine, p.92 T5R3. Length of abandonment = 13 mi. The Bald Mt. RR was a logging railroad running from the Canadian Pacific railroad tracks at Jackman Station, through Jackman Mills, north along the Heald Stream into Sandy Bay</td>
<td>Project Historian</td>
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<td>MAP #</td>
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<td>58</td>
<td>Plainfield, Vt.</td>
<td>43-14</td>
<td>Montpelier/Wells River Railroad: Timber railroad which ran along road through Groten State Forest.</td>
<td>Project Historian Reported to Project Historian Warren Farrington</td>
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## INDIAN TRAILS

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<td>Dixville, N.H.</td>
<td>18-7</td>
<td>Coos Trail</td>
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<td>Pontook Trail</td>
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<td>St. Johnsbury, Vt.-N.H.</td>
<td>43-7</td>
<td>Indian Trail along Bailey-Hazen Road. Peacham</td>
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<td>Price, 1958:2</td>
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<td>Stratton, Me.</td>
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<td>&quot;Arnold Trail to Quebec. Along the Kenebec River, through Wayman and Flagstaff Lakes, along the Dead River, and chain of ponds to Quebec, Canada&quot; (Nat. Reg.).</td>
<td>National Register</td>
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<td>Woodsville, Vt.-N.H.</td>
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<td>Bailey-Hazen Military Road. Constructed 1776-1779. Associated with Peacham District, thus has integrity.</td>
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<td>Route</td>
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<td>Vt. Historical Sites, Districts, and transportation Routes Map.</td>
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</table>
* Photographs 1 - 21 and 30 - 69 were analyzed by Mr. Richard Barons, Curator, Roberson Center, Binghamton, New York.
Photo No. 1
Site No. 18/7/1
Round Barn. Most important round barn of the 19th century construction, ca. 1875. A rare form.

Photo No. 2
Site No. 35/7/3
Two story framehouse, ca. 1870s.

Photo No. 3
Site No. 37/7/4
1860s frame dwelling following Greek trims well into Victorian times,
Benton House. What stands today is completely 19th century Greek Revival. Detailing is late Greek Revival ca. 1845. The 1778 structure may stand as the frame for this building, but the side pilasters, the cornice, the window frames are typical of this late Classic style.

Covered Bridge, 1862. Covered bridge of good style. These are all rare today, even though New England has saved the greatest number into the 20th century.

Two story red brick house, 1823.
Site No. 43/5/1

A Greek Revival farmhouse, ca. 1840-1850.

Photo No. 8

Site No. 43/6/2

Elkins Tavern. A fine example of post-colonial or Georgian style building. The double sized door, reeded pillasters, gabled design with transom window are typical Connecticut River Valley types. The five bay wide facade has paired windows. Very typical of the 1780 period. A good strong example.

Photo No. 9

Site No. 43/7/4*

Peacham Academy. A Greek Revival structure, at least the detailing is of such a date - on design alone - even angle of roof gable, ca. 1835.
Photo No. 10
Site No. 43/8/6
1 1/2 story brick farmhouse, ca. 1820.

Photo No. 11
Site No. 43/8/6
1 1/2 story brick Federal style "cape" ca. 1810. Note simple detailing - transom window above door, thin and simple moldings.

Photo No. 12
Site No. 43/8/6
Greek Revival frame 1 1/2 story farmhouse with strong details - note wooden lintals over windows - a design to look like stone ca. 1850.
A type of Maine-style house often called a "cape". The ell is most likely of the same period as the main section - Greek Revival, ca. 1840-1850.

Late 19th or early 20th century frame house of the simple shingle type.

A mid-19th century frame house of Greek Revival detailing, but the pitch of Gothic Revival, ca. 1860.
A very fine Gothic Revival frame house of ca. 1855. The typical central gable facade has wooden tracery of a most handsome design. The front porch has scrolled brackets. The plan of the house follows a classic Greek floorplan. A very good example.

House in rear of photograph is Second Empire French, dating from about 1875. House in front of photograph is ca. 1885-1895, "no-style".

The high pitch of the roof on Greek Revival farmhouse dates structure ca. 1850-1860. Note heavy moldings and "add-on" of the dependants.
A Greek Revival brick farmhouse, ca. 1840

Farmhouse, ca. 1860-1870

Barn may have been built in 1833 as date in gable suggests. The transom window above entrance is known to be in use earlier but the large overhang of roof suggests 1850-1860.
Photo No. 22

Site No. 01/3/2*

Site of Xavier Cry sawmill.

Photo No. 23

Site No. 01/3/3*

Site of Villa d'Aigle, oldest structure in St. Francis, Aroostock County, Maine.

Photo No. 24

Site No. 37/8/1

19th century cemetery
Photo No. 25
Site No. 37/10/2
19th century cemetery

Photo No. 26
Site No. 39/6/1
19th century cemetery

Photo No. 27
Site No. 42/2/1
19th century cemetery
Photo No. 28
Site No. 44/7/1
Site of Indian trail and artifacts.

Photo No. 29
Site No. 43/6/3
Peacham stockade site.

Photo No. 30
Site No. 56/5/4*
Brick Greek Revival of typical center entrance. 9-pane eyebrow windows. 1½ story home, ca. 1825-1850.
Photo No. 31
Site No. 56/4/3*
Babcock House. Frame 1½ story Greek Revival with brick ell, ca. 1835-1850. A common form.

Photo No. 32
Site No. 56/3/2*

Photo No. 33
Site No. 56/3/2*
District School #2. Gable detail typical of ca. 1850 on late Greek Revival buildings. Overhang on roof is also a late feature and could date as late as Civil War.


Lampman House. Simple 1½ story frame dwelling ca. 1860-1870. Little style except side porch columns with brackets typical of this era.
Photo No. 37
Site No. 56/3/2*
Bland House, ca. 1860-1870

Photo No. 38
Site No. 56/3/2*
Willard House, ca. 1860-1870.

Photo No. 39
Site No. 56/3/1*
Chapman Farm. Box-like 3 bay Federal/Greek Revival 2-story frame home with simple transitional moldings. Cornice is simple and more Federal. Front window caps are late Greek, ca. 1835-1850. Common type.
Photo No. 40  
Site No. 55/3/6  
Miles Farm. Barn complex dating from 1880-1920.

Photo No. 41  
Site No. 55/3/5*  
Schoolhouse. These do not often have much style, Could date ca. 1855-1870.

Photo No. 42  
Site No. 55/4/7*  
Ezerman House. Large Greek Revival 2-story brick farmhouse, ca. 1835-1845.
Photo No. 46
Site No. 55/1/3
Clark farm. Simple 2 story frame dwelling, ca. 1850.

Photo No. 47
Site No. 55/1/2*
Clark house. Brick 3 bay facade. 2 story Greek Revival house, ca. 1845.

Photo No. 48
Site No. 55/1/1*
Farr House. Greek Revival frame farmhouse with heavy wooden lintal over central doorway. Note side lights, pilasters, etc. ca. 1845.
Conant Tenant House.
Large Victorian farmhouse of Italian taste. Typical of ca. 1875.

Greek Revival 1½ story brick home with impressive entrance. Most interesting is the window design of the side lights and the recess of the entire doorway within a surround of limestone. Very good cut stone foundation. ca. 1840.

Route 2 bridge. Iron arched support. ca. 1875.
Checkered House. Very interesting and important Federal/Greek Revival home laid in a diamond brick band with dark hedders creating a rich pattern, ca. 1840.


Westfall farm.
Photo No. 55
Site No. 49/10/7*
Albert townhouse. Federal style farmhouse with changed windows. Could have been built as early as 1825 and as late as 1850.

Photo No. 56
Site No. 49/10/6*
House on right is quite old, possibly 1825. Home on left is Civil War period.

Photo No. 57
Site No. 49/10/6*
Greek Revival frame house. ca. 1845.
Photo No. 58

Site No. 49/10/6*

Greek Revival 1½ story frame house built in a transitional style between the Greek and the Italian Villa. ca. 1850-1860.

Photo No. 59

Site No. 49/11/9*

Gleason Farm. A highly important brick Greek Revival house with the "unique" feature of five fan shaped windows. Very rare and very good. There are times when these fan shaped windows are used above the main entrance or as attic windows in the gable ends, but as a row of eyebrow windows is almost unheard of. ca. 1840.

Photo No. 60

Site No. 49/10/8*

Sunshine Farmhouse. Frame Greek Revival. ca. 1835-1850.
Photo No. 61
Site No. 49/7/5
Old Murray farm. Greek Revival, ca. 1845.

Photo No. 62
Site No. 49/7/5
Quinn's Store. A Greek Revival complex dating ca. 1850.

Photo No. 63
Site No. 49/7/5
Jonesville Bridge. A steel frame structure ca. 1870.
Photo No. 64
Site No. 49/7/5
Lavanway Residence,
ca. 1875-1885.

Photo No. 65
Site No. 49/7/5
Barn, ca. 1870 turned
into a home.

Photo No. 66
Site No. 49/7/5
An interesting 1860s
central gable facade frame
with both Greek Revival
and Victorian designs.
Common late form.
Photo No. 67
Site No. 49/4/4
Tracy Place. Very hard to date "no-style" home. ca. 1870.

Photo No. 68
Site No. 49/3/2
Roederer farm. Very hard to date.
Photo No. 69

Site No. 49/4/3

Callahan Place. Very hard to date.
APPENDIX B

AN OVERVIEW OF THE PREHISTORY OF

NORTHERN NEW ENGLAND
APPENDIX B
AN OVERVIEW OF THE PREHISTORY OF NORTHERN NEW ENGLAND

A. INTRODUCTION

Appendices B and C discuss the culture history of Northern New England to provide an interpretive context for cultural resource materials that may be found within the study area. The basic perspective of both appendices is to elucidate changing patterns of human land-use through time.

The historic overview goes into some detail as to specific episodes so that the possible significance of standing structures can be more easily assessed. In contrast, this overview will be more general in nature for a number of reasons. First, our understanding of northern New England prehistory is limited by our incomplete knowledge of both time periods and geographic areas. Furthermore, even in those better understood periods and areas there is debate over basic questions such as the temporal sequence of materially separable cultures and/or their geographic extent (e.g., see Fitzhugh 1975). Given the inadequacy of our knowledge, the detailing of land-use patterns is problematic. There are three basic concepts which enter into our discussion of prehistoric land use. These are environment, culture, and adaptation. The environment is the natural setting of human activity. It places general limits on appropriate lifestyles, but is not an absolute determinant of particular land-use patterns.

Culture may be defined as human behavior and patterns created by that behavior. Modification of raw materials by human behavior produces tools; modification of the environment by human life support activities produces sites. Culture provides an intermediary between man physically and the environment. Adaptation is the role(s) culture can play between man and the environment.
Land-use patterns result from the interaction of culture and environment, but there are many possible cultural adaptations to any single environmental setting. Studies of pluralistic adaptive patterns contained within a single geographic area serve as cautionary notices to those who would attempt a deterministic explanation for human behavior (see Bennett 1969; Vogt and Albert 1970).

Our limited knowledge of both temporal and geographic settings in northern New England prehistory, and the unsuitability of environmental determinism for advancing our understanding, are the primary reasons for not attempting a more specific overview. While not pretending to be comprehensive, we do attempt to treat all units of space and time in a comparable fashion.

B. THE NATURAL SETTING

The present physiography of northern New England was shaped by climatic fluctuations of the Wisconsin glacial period. During the last cycle of the Late Wisconsin (ca. 17,000 B.P.), ice sheets covered the region as far south as Long Island, New York. Glaciers maintained their maximum extent for at least 2,000 years before beginning to retreat north. About 12,500 years ago, the ice sheet boundary lay to the northwest of the St. Lawrence Lowland, opening New England to possible exploitation by human groups (Borns 1973).

The glaciers left a landscape ruggedly carved by the action of massive ice sheets. The weight of these sheets had depressed the land as much as 1000 meters below present sea level, while the sea level itself was lowered due to the vast amounts of water locked up in glaciers. With the melting of ice sheets, the land began to rebound upward toward present elevations, but not as rapidly as the rise
in sea level. For a time, lowland Maine was covered by a shallow sea as far inland as East Millinocket and Bingham. This sea deposited much of the contemporary clay and silt soils found in the lowlands (Borns 1973).

The region can be divided into two physiographic provinces: The lowland littoral (head-of-tide presently reaches as far inland as Bangor) and the interior uplands. Following glaciation the uplands were changed by erosion as modern drainage systems formed. It is within the upland province that the St. John, Allagash, Penobscot, Kennebec, Androscoggin, Connecticut and Winooski Rivers arise. These are the major drainages of northern New England and among those providing the setting for prehistoric activity.

Present-day vegetation is classed generally in the Northeastern Transitional Forest regime, which is dominated by conifers and hardwoods in various combinations dependent primarily on elevation. Appalachian Oak Forest and Northern Hardwoods Forest extend into the southern reaches of Northern New England. Of course, the contemporary forest cover is an expression of recent climatic factors. Fortunately, information concerning the evolution of the floral environment is available.

Using pollen data from two locations in south-central Maine, Bradstreet and Davis (1975) warn that "cause-and-effect relationships between climate and palynology are tenuous" (Bradstreet and Davis 1975:19), but still useful for depicting general change. By the same token, radiocarbon dates pertaining to notable shifts in pollen frequencies at the study locations become less applicable further afield, but again the dates are fair approximations of region-wide environmental change.
In the period following glacial retreat and up until ca. 9700 B.P. the region was covered by tundra similar to modern circum-polar environments. From 9700 to 4700 B.P., or perhaps later, conifer-hardwood mixed forests predominated with the conifers "more or less" dominant. The period is subdivided, the earlier part (9700-7100 B.P.) characterized as "a somewhat open pine and oak-dominated forest of low diversity" (Bradstreet and Davis 1975:16). Ecosystem productivity seems to have been lower than at present during this warm and dry subperiod. During the later subperiod, dating ca. 7100-4700 B.P., hemlock and birch joined pine and oak as important species, which indicates an increase in forest diversity suggesting that "relative productivity...may have been somewhat higher than at present" (Bradstreet and Davis 1975:16). Forests changed from "somewhat open" to closed conditions. After 4700 B.P., dominance shifted from conifers to hardwoods, initiating a trend that continues with fluctuations, to the present. Relative productivity appears to drop at the beginning of this period, but then increases and peaks between ca. 3400 and 200 B.P. at which time the European exploitative patterns became noticeable.

In summary, major changes in the floral environment, perhaps due to climatic shifts, have been identified at about 9700, 7100, 4700 and 3400 B.P. Relative to present conditions, ecosystem productivity was lower until about 7100 B.P., higher until 4700 B.P., then declined following an inferred thermal maximum, and reached its highest levels after 3400 B.P.
C. ABORIGINAL CULTURE HISTORY

As described above, this study views culture as the non-biological, human means of adaptation to the environment. Archaeologists gain insight into past human lifeways through study of material culture, i.e., stone, bone, wood, and ceramic artifacts, and features such as hearths, storage pits, and house plans. The non-material or behavioral aspects of culture are inferred or deduced from the spatial relationships of the artifacts and features within a site and from the positioning of sites within a regional ecosystem. Culture is a dynamic system, and it is the systemic and systematic interrelationships of artifacts, features and so on that allow the unveiling of prehistoric behavior.

The cultural system, as an adaptive mechanism, is integrated with the environmental system. For human populations inhabiting a particular region, long-term environmental shifts entail adaptive cultural change if those populations are to persist in that region. In the short run, the cultural system provides a framework for minor behavioral adjustments which may be expressed materially (new artifact forms, for example) or non-materially (new types of site locations, for example). Inferences about the containing environmental system may be made from study of the cultural system. The independent study of the environment, however, through such means as geology and palynology, bolsters the archaeologist's interpretive ability in regard to the cultural record. The following description of northern New England culture history relies on knowledge of past environments and material and non-material expressions of past behavior over space. The correlation of these, together with radiocarbon dating and other independent assessments, provide the temporal framework for a summary of changes in the cultural system through time.
1. The Paleo-Indian Period (11,000-8,000 B.P.)

The earliest manifestations of human activity in North America bear a striking, continent-wide similarity. The similarity is based on use of a fluted, bifacially-worked projectile point style, a somewhat limited range of unifacial, chipped-stone tools, and a major reliance on large game animals for subsistence.

Compared to later time periods, relatively few Paleo-Indian sites are known, due in part to the impact of natural processes, but also due to an overall low population density. For northeasternmost North America, eight sites are known (see Figure B-1), although stray finds of the diagnostic projectile points have been reported elsewhere in the region (see Ritchie 1965; Funk 1972; Harp 1977).

Paleo-Indian occupation in the region occurred during the period when the environment supported tundra-like vegetation and, later, the early, open pine-oak forest. The major subsistence pattern is believed to have centered on caribou hunting, although smaller fauna and floral products were almost certainly important as well (Funk 1972).

Early Paleo-Indian assemblages from Michigan to Nova Scotia exhibit remarkable consistency in tool forms apart from projectile points. Almost universally present are biface knives, biface preforms, end scrapers, side scrapers, flake knives and other unifaces. In shape, size, and mode of retouch the unifaces are usually easily distinguished from unifaces of later cultures. Also, many end scrapers and some side scrapers bear small projections or "graving spurs" on the working edges...(Funk 1972:17).

Working bone is inferred from these latter tool types, while the other types were most likely used for processing meat and other subsistence items; animal hides and wood.
FIGURE B-1
KNOWN PALEO-INDIAN SITES

KEY
PALEO-INDIAN SITE
PROJECT BOUNDARY

Sources: Ritchie, 1965; Ritchie and Funk, 1973; Harp, 1977
Decisions regarding site locations seem to have focused on a few factors: Well-drained prominences close to tool and/or food resources, for dry living-floors and for the observation of game movement, or locations offering protection from the elements. Thus, one would expect to find sites of this period in caves or rockshelters, or atop knolls, terraces, or ridges (Funk 1972:23).

Paleo-Indian sites were probably inhabited by small bands engaged in a free wandering existence (Ritchie 1965). Funk, drawing on a relatively larger sample of Northeastern sites, argues that the early sites can be fruitfully compared, by analogy, to ethnographically known caribou hunters who exploit an environment "very similar to the reconstructed late-glacial environment of the Northeast" (1972:30). Using this model, he suggests that the Reagen, Bull Brook, and Debert sites (see Figure B-1) may have been of a central-base type, "near major caribou routes, where bands spent much of their time and engaged in numerous activities" (1972:31). In contrast, the Wapanucket-8 and Davis sites appear to have been "fall-winter hunting camps occupied by only one or two families" (1972:31). Other possible site-types mentioned by Funk include resource-extraction loci with the differences between types based on whether the resource was food or non-food (for example, quarries for stone tools).

2. The Archaic Period (ca. 8000-3000 B.P.)

The earlier part of this period is very poorly known; it is assumed that Paleo-Indian populations adapted to the changing environment and their culture evolved into that of the generalized Northeastern Archaic tradition known as Laurentian. Ritchie describes this tradition as a:
...cultural continuum, widely spread throughout northeastern North America, with its major area of development and diffusion within southeastern Ontario, southern Quebec, northern New England, and northern New York. Its most diagnostic traits, occurring in considerable morphological variety, comprise the gouge; adz; plummet; ground slate points and knives...(1965:79).

At a finer scale of resolution, it is apparent that "the basic Laurentian traits, geared to the livelihood of hunters and fishermen, underwent regional specialization to various degrees, probably in response to better ecological adjustment" (Ritchie 1965:79). These regional adjustments can be viewed through time, as well, developing toward what has been termed "primary forest efficiency" (Caldwell 1958). This concept describes the cultural response of populations exploiting an environment which was increasing in its diversity and productivity. Evidence of populations adapting successfully is not only by mere persistence, but by their growth in numbers. Exploitative efficiency reached a level where surpluses accumulated, requiring storage facilities. Such efficiency led to increasing social stability and development of technological skills. "Settlement patterns, although seasonal and still semi-migratory, became more regular, and cycled through an annual round of favored dwelling sites" (Harp 1977:52).

These settlement patterns seemed to be centered on the major drainage systems of the region. The annual round most likely consisted of groups coming together at semi-permanent base camps after relatively brief hunting or foraging expeditions to discrete resource locations. In this context of exploitation, the interior upland province was never truly settled, rather, it was utilized on a seasonal basis for hunting large game animals. Most activities took place in lower reaches of the drainage systems, and almost all of the known sites are located in the vicinity of water features. Aside from the richness and diversity
of resources found at these locations, it is generally thought that the waterways also served as the major transportation and communication links. Penetration of the dense forests was apparently not undertaken on a systematic basis.

The culmination of the Archaic in this region is manifest in the "Red Paint" cemeteries of the Moorehead Complex (Sanger 1973) which is nearly coeval (ca. 5000-3500 B.P.) with the last environmental period defined by Bradstreet and Davis (1975). Although known from numerous earlier cemetery excavations (e.g., Moorehead 1922; Willoughby 1935), a fuller understanding of New England Archaic lifeways is emerging through recent investigations of habitation sites in Maine, both in the interior (Sanger and McKay 1973; Sanger 1975; Snow 1975) and on the coast (Bourque 1975).

The most striking feature of the Complex stems from finely worked artifacts, notably of slate, which occur with interments in graves lined with red ochre (hence the "Red Paint" appellation). This elaboration of burial practices is assumed to be one indicator of the overall relatively high level of cultural development. For the Maine group, Bourque (1975) sees a major adaptative focus on marine and riverine resources with, apparently, two types of inland sites as well as coastal habitations. "The first includes those sites located on major river channels...overlooking areas in which salmon were once caught in large numbers. ...The second category includes sites located on relatively shallow and rapid channels, more suitable for preying upon spring runs of alewife and smelt than for salmon" (Bourque 1975:42). Similar patterns could be hypothesized for the western portions of the region, except that in the absence of direct access to marine resources other seasonal pursuits would replace coastal exploitation.
3. The Woodland Period (ca. 3000-400 B.P.)

Following cultural adaptation to the stabilization of the environment after the glacial period, cultural lifeways continued with few changes. Change is mainly seen in the evolution of artifact forms. The Archaic form of adaptation was stable and long lived. Horticulture may not have been practiced in the eastern portion of the region until historic times.

The Woodland period represents a new kind of adaptation; manipulation of the environment by raising crops. This was a major cultural change with many behavioral ramifications. The material hallmark of this period is the development of ceramic technology in the region.

The introduction of the cultigens corn, beans and squash sometime after A.D. 1000 provided a staple diet. "Settlement patterns were altered by a new emphasis on larger, permanent villages in areas that were most suitable for (farming). ...Occupations were always in flat lowlands associated with the drainage systems" (Harp 1977:61-62). Population growth was another outcome of stabilization of the subsistence base, resulting in an increase in the size and number of sites. Also, seasonal exploitation of various resources located away from habitations provided a complement to the staples.

Bourque (1973) has examined Maine coastal data in an attempt to identify prehistoric seasonal subsistence patterns. During the period from about A.D. 200 to A.D. 1150, "there are clear suggestions that coastal habitation and exploitation occurred during the late winter and early spring. Presumably, various inland locations adjacent to rivers and lakes were inhabited during the balance of the year" (Bourque 1973:3). Sometime between 1150 and 1550, when
historic observations were made, this pattern changed: Coastal resources were exploited during late spring and summer, and populations lived inland during the late winter-early spring period. This change may have been caused by a climatic shift, by contact with Europeans, or by some other factor (Bourque 1973:9-10).

4. The Historic Period (ca. 400 B.P. - Present)

It is readily apparent that the advent of European exploration, exploitation, and colonization had profound effects on aboriginal lifeways. The fur trade became important early in historic times, and, by shifting emphasis to certain game animals such as beaver, the Indians - eager to obtain European trade items - were constrained to alter their seasonal patterns as well. Numbers were reduced by diseases for which the Indians had no natural immunity, and by the warfare which also served to disrupt aboriginal patterns (see Appendix C). In little more than two centuries, the only Indian groups remaining in northern New England were remnants of the Penobscot and Passamaquoddy tribes. An epoch had ended.

D. SUMMARY

The foregoing has been a general overview of northern New England prehistory attempting to limn in the essential outlines of human land-use. The resources and natural routes afforded by rivers and their major tributaries seem to have always been important. With few exceptions related to particular, discretely-located resources, we expect to find almost all prehistoric sites
situated in proximity to water features. This is only a prediction of the lowest order, however; our knowledge of regional prehistory is still quite limited, especially its manifestations in the interior. Sample-survey approaching a regional perspective has been undertaken in very few instances (for example, Newdorfer n.d.).

Clearly, much more research is needed in northern New England; the quantity and quality of work in the past decade is especially encouraging. It has surplanted years of near-neglect by professionals. In another ten years' time there will still be blank pages in the prehistoric record, but the number of lacunae will have substantially diminished and any attempt at a regional overview will be more easily accomplished.
APPENDIX C:

A HISTORY OF NORTHERN NEW ENGLAND

by Jerold Pepper
I. INTRODUCTION - SCOPE OF STUDY

II. HISTORIC TRENDS IN NORTHERN NEW ENGLAND

A. The pattern of Warfare and Boundary Disputes
   1) Introduction
   2) The Historical Background
      a) The Strategic Setting: Early French Exploration and Settlement 1534-1689
      b) The Strategic Setting: Early English Exploration and Settlement 1488-1630
      c) The Puritan Community 1630-1675
      d) King Phillips War 1675-1677
      e) Conflict Between France and Britain 1689-1755
      f) The French and Indian War 1755-1763
      g) The American Revolution 1775-1777

B. Agricultural Development and Land Usage in Vermont and Western New Hampshire
   1. Introduction
   2. The Historical Background
      a) Land Settlement in New England 1763-1776
      b) The Development of Subsistence Agriculture in Northern New England 1776-1820
      c) The Evolution of Commercial Agriculture in Northern New England 1820-1865
      d) The Import of Industrialization in the Nineteenth Century

C. Land Usage and the Exploration of Forest Resources in Northern New Hampshire and Northwestern Maine
1. Introduction

2. The Historical Background
   a) Logging in New England—The Colonial Legacy
   c) Industrialization, Consolidation, and the Rise of the Wood Pulp Industry in Northern New England 1890-1940

III. A FINAL THEME: THE ACADIAN MIGRATION 1755
I. INTRODUCTION - SCOPE OF STUDY

The proposed Dickey/Lincoln School transmission lines will pass through portions of the states of Maine, New Hampshire and Vermont. The purpose of this study is to provide a guide to the types and distribution of significant historic resources in this area. It is not meant to be either an exhaustive inventory of the existing resources in the area, or an extensive historical narrative of the region. The scope of this study is constrained by three practical considerations: the limitations implicit within a Phase I investigation, the nature of the proposed construction, and the character of those significant historical events most likely to produce existing resources.

Within the scope of the study, it was necessary to summarize the extensive amounts of historic literature pertaining to northern New England, and to condense it into a concise and workable form. This task was accomplished by reviewing the existing secondary literature. Review of the literature provided historic trends which account for those historic events which most readily characterize the region and its relationship to the rest of the world, and provided an instrument for identifying resources and assessing their possible significance. In short, the use of historic trends represents an attempt to apply existing historical data to the specific goal of this report.

The three historic trends which best characterize the history of northern New England are: a pattern of warfare and boundary disputes, the development of land usage based on the evolution of both subsistence and commercial agricultural settlements in the western part of the region, and the development
of a type of land usage based on the exploitation of forest resources in the eastern part of the region. As in any attempt of summarization or synthesis, this report may have both possible omissions as well as the bias of the researcher. It is hoped that any oversights will be rectified in further, more intensive investigations.
II. HISTORIC TRENDS IN NORTHERN NEW ENGLAND

A. The Pattern of Warfare and Boundary Disputes

1. Introduction

The Europeans who first penetrated the wilderness of northern New England were quick to recognize the rich store of natural resources (Thompson 1942:2). The great New England pine belt from Nova Scotia to Lake Champlain was alive with a wide variety of wild game. Fur bearing animals (muskrat, mink, otter, and beaver) dwelled along the streams and the ponds largely undisturbed by man; fish swarmed in the waters of the region. Centuries of undisturbed forest growth created a rich soil of potentially high productivity for farming. The great network of rivers, streams, and lakes which drained the area formed transportation routes which provided access into the area from the main centers of settlement along the coast and from Quebec. Yet despite the accessible resources in the region, northern New England remained an almost entirely uninhabited backwoods area until after the American Revolution.

The retardation of settlement and economic growth in the area was caused by a series of wars. Accidents of geography and history placed northern New England astride the major transportation routes between the French settlements in the north and the English settlements in the south (Thompson 1942:14). Throughout most of the seventeenth and eighteenth centuries northern New England remained a buffer zone contested in three major wars and many unrecorded wilderness
skirmishes. Until the American Revolution the region remained too unstable and dangerous to attract serious settlement. As a result the early history of northern New England is dominated by the strategic role it played in warfare between the Indians and English settlers, the French and the English, and finally between the Americans and the British.

2. The Historical Background

(a) The Strategic Setting: Early French Exploration and Settlement, 1534-1689

In 1534, Francis I, King of France, sent Jacques Cartier on the first of three voyages up the St. Lawrence River. The French monarch believed the St. Lawrence to be the entrance to the fabled northwest passage to the Orient. On Cartier's third voyage, in 1541, he built a fort on the site of modern Quebec and established a small colony there. Within a year this small settlement was abandoned. Mounting debts and civil unrest at home led the French to delay their plans for a colonial empire (Malone 1960:27).

In 1609, another Frenchman, Samuel de Champlain, followed Cartier's route up the St. Lawrence and reestablished the colony at Quebec. Champlain was an adventurer who wanted to build a monopoly out of the lush supply of fur bearing animals in North America (Malone 1960:27). Champlain penetrated the interior of northern New England and explored the area around the lake which bears his name. He also sent out parties of explorers who followed the lakes and rivers as far west as Missouri and Minnesota.
Champlain's preoccupation with the fur trade set the tone for French colonization. Profitable trade in furs required a stable and friendly relationship with the local Indians. Champlain organized alliances between the King of France and the Algonquin-Huron Confederation of Indian tribes. He helped these tribes expel the Iroquois from the St. Lawrence Valley, which both secured a monopoly of the rich fur trade for France, and drove the powerful six nations into an alliance with the English (Blum 1966:237).

The French emphasis on the fur trade inhibited the long term development of the Canadian colonies. The French colonies tended to attract men whose chief ambition was to make money trading furs and return to France. The agricultural settlements which were established were employed to supply the needs of the voyagers and the fur merchants. The importance of the fur trading to the French was accomplished by a commitment to the conversion of the Indian population to Catholicism. The Jesuits, the chief instrument of the French missionary efforts, arrived in Canada in 1632. The French voyagers in pursuit of beaver pelts, and the Jesuit priests in pursuit of the souls of the Indians pushed into the interior of northern New England (Malone 1960:29). In countless unrecorded episodes these men were the first Europeans to explore the rivers and lakes in the area.

(b) Early English Exploration and Settlement 1498-1630

English claims to North America were based on the voyages of Giovanni Caboto Montecataluna, a Venetian captain more commonly known as John Cabot. In 1496, King Henry VII financed an expedition under Cabot's leadership. The English monarch hoped to uncover the location of the mythical seven cities of gold.
Cabot made three separate voyages to the new world: the first in 1497, the second the following year, and the third, a joint English-Portuguese expedition in 1501. During these voyages Cabot explored the coast of Greenland and Labrador, and made a landfall on the North American coast at Newfoundland. Further English explorations occurred in 1507 when Cabot's son Sebastian led another expedition to the coast of Newfoundland (Malone 1960:30).

In 1606, King James I of England issued a patent authorizing two companies to set up colonies in what was then known as Virginia. This was a huge area stretching from the 34th to the 45th parallel, between the Cape Fear River and the present site of Bangor, Maine. The London Company was to begin settlement in the southern part of the territory, the Plymouth Company the north. The specific land grants were to center in the first set of settlements in each instance, extending 50 miles north and south along the coast, and 100 miles inland (Malone 1960:36).

The first attempt at English settlement in New England occurred in 1607, the same year that the first settlers arrived in Jamestown. The Plymouth Company sent an expedition of two ships with 120 men, which arrived at the coast of Maine and pushed up the mouth of the Kennebec River. Inadequate support from England caused the small settlement to be abandoned before the year was out. The reports of fur and timber in the region attracted numerous expeditions in the following years. Fishermen exploiting the rich fisheries ventured along the northern coast and trading posts were maintained on the rivers. In 1620 the Pilgrims, a group of religious separatists living in exile in Holland, obtained a grant from
the Virginia Company of London. Later that year ocean storms pushed the Pilgrim settlers north forcing them to make a landfall on the Massachusetts, rather than the Virginia coast. After a difficult winter, the Pilgrim settlement at Plymouth grew, but never obtained the success of later immigrant groups.

In 1621, Sir Fernando Gorges, a wealthy member of the court of James I, obtained control of the Virginia Company of Plymouth. Gorges envisioned the area between the St. Croix and Connecticut Rivers as a preserve for aristocratic royalists and the Church of England. Elaborate plans were drawn to divide the land among baronies, lordships, and manors whose owners would enjoy feudal privileges. In 1629, after several unsuccessful attempts at settlement in the New England coast, George Mason, an associate of Gorges, established a colony at Portsmouth. Gorges' plans for an aristocratic colony in New England died amid the shifting political fortunes during the English Civil Wars (Sanborn 1904).

(c) The Puritan Community 1630-1675

The English Civil War which occurred in the 1640s has also been called the Puritan Revolution. The word Puritan did not denote an individual religious sect. Rather, it represented a large segment of English society which advocated a strict form of Calvinism and was united by a revulsion over what they considered immorality in the monarchy and heresy in the Church of England. Puritanism appealed most strongly to the emerging commercial class in England. As the medieval economy gave way to capitalism, merchants and commercial farmers began to dominate the nation's wealth which had previously been the domain of the
land owning aristocracy. During the seventeenth century, the Puritans' control over the economy led to a conflict with the royalists over political control. This conflict was the essence of the English Civil War. The execution of Charles I in 1649 marked the Puritan ascension to political power which reached a peak during the Protectorate of Oliver Cromwell (1653-58) (Hill 1966:163-186).

During this period of instability in England, a group of Puritans received a charter for land along the coast of Massachusetts. The leaders of the Puritan migration viewed the settlement as an experiment, "the city on the hill" located far from the corruption of England and dedicated to the pious path of Godliness. The community of the chosen set out in 1630 on seventeen ships led by Governor John Winthrop. Unlike earlier settlers, the Puritans brought considerable wealth with them. Guided by religious zeal, well financed, and with powerful friends in England, the Puritan settlement at Massachusetts Bay quickly grew. By 1675, the Puritan settlement had flourished and spread along the coast of Massachusetts, Connecticut, and Long Island. Other Puritan settlements pushed northward up the Connecticut River into western Massachusetts and a settlement of Puritan exiles was established at Rhode Island. During the English Civil War the Puritan magistrates gained control of Fernando Gorges' settlements in New Hampshire and other settlements along the coast of Maine.

(d) King Phillips War 1675-1677

Unlike the French, the Puritan settlers viewed themselves as permanent inhabitants of the colonies. The English settlements were based primarily on
agriculture, which required land which had been controlled previously by the Indians (Malone 1960:29). In 1675, the increasing European expropriation of Indian land, necessary to feed the growing settlements, led to war. King Phillip, sachem of the Wampanoags who lived east of Rhode Island, refused to accept a disarmament treaty offered by the Boston authorities, and his warriors raided the Plymouth frontier. This might have remained a local affair, but Massachusetts Bay seized the opportunity to gain control of land in Rhode Island by sending an army against the Narrogansett tribe. This invasion led all the New England tribes to unite under the leadership of King Phillip. The bloodiest war in New England history followed. Exposed frontier towns were raided and each side massacred men, women, and children, and burned villages. The whole belt of English settlements beyond the seacoast was deserted, and Boston began preparing fortifications. English settlement was in danger of extinction when the death of King Phillip in 1677 ended the war (Thompson 1942:8). The war caused a severe retardation of English settlements and pointed out the weakness of their exposed northern flank. Indian control of the Connecticut River had allowed them to make quick forays against settlements in Connecticut and Massachusetts. To prevent any recurrences, the Puritans took steps to control the river corridor into southern New England. Fortifications were established along the Connecticut River at the present site of Brattleboro (Fort Dummer) and Charlestown, New Hampshire (Number Four) (Thompson 1942:8). These forts were garrisoned by rangers who were to watch for Indian activity, and were paid by the colonial government of Massachusetts.
(e) Conflict between France and Britain 1689-1755

While the New England settlers were recovering from the effects of King Phillips War, events were occurring in Europe which would have a profound influence on northern New England. By the middle of the seventeenth century, European governments were beginning to understand the importance of trade and commerce to national wealth and power. Spain, the original colonial power, had exploited its colonies for their obvious riches in silver and gold, but failed to take advantage of their full potential for trade. This failure, compounded by the antiquated feudal social and political structure led to the decay of the Spanish Empire by the mid-seventeenth century (Blum 1966:381-386). During this period the Dutch began to fill the trade vacuum left by the Spanish. Dutch traders built up a trading empire in the Mediterranean, the Baltic, and Continental Europe, and their colony at New Amsterdam gave them a foothold on the North American coast. During the 1640's and 1650's the English passed the Navigation Acts which were aimed at excluding the Dutch merchants from the English carrying trade. In addition, during this same period, the English and Dutch fought three short wars. By 1688, it was clear that Dutch merchants would play a secondary role to English commerce in Europe and America (Hill 1966:195).

The remaining nation in Europe powerful enough to challenge English trade supremacy was France. Beginning in 1689 and lasting until 1763 England and France fought a series of wars. Although the direct cause of these conflicts were disputes over claims to the thrones of Spain and Austria, they were also fought over the domination of the trade those nations controlled in Europe, and
through their colonial possessions. While these wars were fought primarily in Europe, campaigning did spill over into the American colonies. In the beginning of the period, warfare in America was confined to the sugar-rich Caribbean. As the eighteenth century progressed, the scope of military conflicts in America became more successful, and as their economic contribution to the Mother Country increased, the military resources allocated to North America increased proportionately. Northern New England became a major battleground during the French and Indian War, which was the climatic struggle for supremacy between France and England.

(h) The French and Indian War 1755-1763

The period of colonial warfare between the French and the British in North America reached a climax in the French and Indian War. This conflict corresponded to the Seven Years War in Europe, and was a continuation of the War of the Austrian Succession. It marked the first time that the European powers committed large-scale military resources to colonial theaters of conflict. Serious campaigning took place in India and North America as well as in Europe.

At the onset of the war in 1755, the French had a marked strategic advantage. French settlements in Canada were protected by a string of well placed strongholds along the frontier between the French and English colonies. The three most important French outposts were located at Duquesne (Pittsburg), Niagara and Ticonderoga. Tied together by a series of smaller outposts, these French positions controlled the Ohio Basin which dominated the Old Northwest Territory, the Niagara Frontier which blocked the entrance to the Great Lakes,
and the Lake Champlain Valley which controlled the river corridor to Quebec and Montreal. British strategy was aimed at winning control of these French strongholds. The French had long realized the strategic importance of the Champlain Valley. As early as 1665, they built a small fort on Isle la Motte to protect the entrance to the Richelieu River. In 1671 they constructed a fort on the western shore of Lake Champlain at Point a la Chevelure (Chimney Point) and began building a fortress at St. Frederic (Crown Point). In 1755-56 with war imminent, the French constructed their stronghold at Ticonderoga which they named Fort Carillon. In the first year of the war, Montcalm, the French commander, further strengthened his hold on the Champlain corridor by seizing Fort William Henry, a British stronghold in the southern end of Lake George (Malone 1960:113).

The British loss of Fort William Henry combined with Braddock's disastrous defeat at Duquesne spurred William Pitt, the British Prime Minister, into action. In 1758 General Abercrombie was dispatched from England with six thousand Scottish Highlanders with orders to push up the Champlain Valley to Quebec. The following year, Abercrombie's force, joined by ten thousand provincial troops, moved up Lake George in more than a thousand whaleboats and batteaux. The outmanned French garrison had turned the approaches of the Fort into a quagmire of felled trees and hidden redoubts. The French ambushed the approaching British, and from behind the walls of the fort, they picked off the English troop formations as they struggled to get free of the underbrush and
trees (Thompson 1942:15). Scattered and worn out, Abercrombie's army retreated to its camp at the head of the lake.

In 1759, the British Army now under the leadership of Lord Amherst, once again attacked Ticonderoga. During the preceding year, despite Abercrombie's failure, the situation of the French had seriously eroded. Fort Duquesne had fallen and was renamed Fort Pitt. The forts guarding Lake Ontario had fallen, and the British had seized Louisbourg at the mouth of the St. Lawrence. The French were now confronted with a three-pronged British threat; west from the Great Lakes, east up the St. Lawrence, and south from the British force on Lake Champlain. Forced to deal with serious threats on three fronts, the French reduced the garrison at Ticonderoga. No longer able to properly man the fort, the French evacuated Crown Point and Ticonderoga and marched to Isle Aux Nois, where a small French fleet could help guard the river. The British force, under Amherst, met no resistance and they quickly occupied the French forts at Ticonderoga and Crown Point (Thompson 1942:16). Amherst settled in at Ticonderoga and began to build ships with which to attack the French at the north end of the lake. In October, Amherst sailed his new ships down the lake and engaged the French vessels, sinking two and capturing a third. The Army followed in batteaux, but the weather turned bad and Amherst retired to Crown Point without attacking Isle Aux Nois.

The same year, 1760, Sir William Johnson captured Niagara, and Wolfe pushed up the St. Lawrence and captured Quebec. The following year, the final French stronghold in Montreal fell to a combined push from the west, east and
from the south where Haviland, who took over from Amherst, completed the job of capturing Isle Aux Noix. Although the European War would continue for another two years, the fall of Montreal marked the end of the warfare in North America. The French and Indian War effectively ended the French threat to English settlement in North America. For the first time in one hundred and fifty years, northern New England could look forward to peace and stability. Large scale military activity had certain benefits for the region. The area had been surveyed and mapped, many people had become aware of the potential for farming and development, and military roads had been cut through the wilderness. The prospect of peace, at the same time at which farmland was becoming scarce in southern New England, brought with it the prospect of substantial settlement in a region where, prior to 1761, it had been too dangerous to live.

(g) The American Revolution 1775-1777

The period of peace and stability in northern New England was shortlived. The battles at Lexington and Concord, in the spring of 1775, marked the beginning of America's military struggle for independence. Once more, the waterways of the area dominated the strategy of military planners. For the British, possession of the Champlain Valley would effectively isolate and possibly contain the rebellion in New England. For the Americans, possession of the Champlain Valley was fundamental to the defense of New England and in addition, it was the key to the conquest of Canada. The conquest of Canada was a particularly compelling goal for the American rebels in the opening years of the Revolution (Luzader 1975:2). During the years of colonial warfare between France and Britain,
Americans had made several attempts to conquer the area. Possession of Canada would eliminate a hostile force which had been a source of tension among the northern colonists since the earliest days of settlement. Since the British had won possession of Canada, during the French and Indian War, Americans had begun thinking of Canada as a sister colony. Few rebel leaders doubted that the Canadians were sympathetic to the American cause and would flock to join a liberating army sent by the American Congress. Finally, the invasion of Canada would deny the British access to one of the few remaining ports of embarkation open to them on the North Atlantic coast. For the next two years, both sides attempted to implement their strategies, and once again, the conflict centered in northern New England.

In the days following the battles at Lexington and Concord, the Americans took steps to secure the Champlain corridor. The states in the region, hopeful of protecting their borders from invasion, acted quickly. The governor of Connecticut provided funds to Ethan Allen, while Massachusetts commissioned Benedict Arnold to secure the Fort at Ticonderoga. In the morning twilight of May 10, 1775 Allen and Arnold, with a small group of backwoodsmen, surprised the small British garrison and bloodlessly captured the stone fortress. In the following days, the Americans moved to consolidate their hold on the Champlain region. A small British fort and garrison were captured at Crown Point, and a British sloop on the lake was successfully taken and rechristened the "Liberty". With the encouragement of the governor of Connecticut, Allen moved his men north-
ward toward Canada. In the fall, Allen, with a group of 400 men, 150 of whom were recently recruited Canadians, reached Montreal. Allen's plan called for a dawn attack along both sides of the river. Before daybreak he began to ferry his men across. Allen's activities on the river had warned the British of his impending attack and while he waited for his men on the opposite bank to get into position, the British struck. By the end of the day, the invading force had been destroyed, with Allen and most of his men being captured. Although Allen's invasion was ill-considered and poorly executed, it was an omen of things to come (Thompson 1942:239).

While Allen was marching northward, Washington was making his own plans for the invasion of Canada. Major-General Peter Schuyler was put in command of the Army of the North stationed at Ticonderoga. The plan called for Schuyler to march up the Champlain Valley and capture Montreal. Schuyler was then supposed to move down the St. Lawrence to attack Quebec from the west. At the same time, General Richard Montgomery and Benedict Arnold, his second in command, were supposed to march an army of 1100 men up the Kennebec River to the Dead River, through the mountains to Lake Megantic and down the Chaudiere River to its mouth in the St. Lawrence. While Schuyler's Army of the North was keeping the British busy west of Quebec, Montgomery was supposed to force on the city from the east. The plan was workable, but complicated; it required coordination between two armies separated by large tracts of hostile territory and it required Montgomery to march his army through several hundred miles of uncharted wilderness. For the plan to work Montgomery's army had to supply themselves from the surrounding area, which made them dependent upon the cooperation of the Canadians who lived there.
To add to the General's problems, Congress was unable to supply the needed men and materials for their march. Schuyler's army was held up several weeks due to the lack of gunpowder necessary to attack the small British force at St. Johns. Due to supply problems, Montgomery was unable to leave until late fall, forcing him to make his march through Maine wilderness in the dead of winter. To add to the miseries of the ill-equipped winter march, a smallpox epidemic broke out among Montgomery's men. By the time he reached Quebec in December of 1775, a large portion of Montgomery's army was incapacitated by the disease, while many others suffered from frost bite and exposure. The dispirited army attacked the city on Christmas Day, the small British garrison successfully repulsed the attack, killing Montgomery during the battle. Arnold, now in command of the Americans, laid siege to the city, attempted, unsuccessfully, to obtain supplies from the Canadians, and sent out urgent appeals for reinforcements (Starkey 1920:40).

While Montgomery was being defeated at Quebec, Schuyler's army successfully captured Montreal. Once in Montreal, the Army of the North was unable to move. Smallpox broke out and the Americans lost thirty men a day to the disease. Supplies of gunpowder were so scarce that many of the men had none at all.

A week after the American's defeat at Quebec, three English ships forced their way through the ice on the river bringing reinforcements and artillery to the besieged city. The following day, the British commander, Sir Guy Carlton attacked the American positions. The Americans could muster less than three
hundred men, the rest of the army had either deserted or was crippled with smallpox. The battle was short; the Americans broke and fled, and did not stop until they reached the Richelieu River. Carlton now turned his attention to Schuyler's army which was occupying Montreal. Schuyler prudently decided to evacuate the city, moving his troops down the Richelieu and back to Ticonderoga, shortly before ice closed down the river to navigation for the winter. The campaign had been a disaster, the Americans had lost over 3,000 men, mostly to smallpox. The hope of conquering Canada was lost, and only Ticonderoga stood in the path of a British army coming down the Champlain Valley.

Before Carlton could attack Ticonderoga, he had to control Lake Champlain. In the early spring of 1776, Carlton set up a base at the northern end of the lake and began constructing a fleet. Carlton hoped to force his way down the lake and march on Albany, where he would unite forces with General Howe, commander of the British forces in New York City.

At Ticonderoga, Arnold was aware of Carlton's plan and began constructing an American fleet to challenge the British on the lake. The shipbuilding on the lake escalated, with each side hoping to build enough vessels to obtain the numerical advantage.

The collision between the two groups occurred in October of 1776. Arnold received word that the British had sailed from their base at the northern end of the lake. Outgunned and outmanned, Arnold stationed his fleet between Valcour Island and the New York Shore. In the two day running battle which followed, Arnold's small fleet was either destroyed by the British cannons, or burned by the crews to avoid capture (Thompson 1942:243).
Carlton had won a pyrrhic victory in the naval battle at Valcour Islands. The months of shipbuilding had cost him most of the campaigning season. It was November before Carlton could transport his army and supplies down the lake. He still had to reduce Ticonderoga, which the Americans had been strengthening, and conduct a winter march through the hostile wilderness which separated Lake George from Albany. Unwilling to commit the same mistake, which the Americans had made the year before at Quebec, Carlton withdrew his troops and marched back to Canada. Arnold's defense at the lake had brought the Americans a year of breathing space, and set the stage for the climactic and final campaign in northern New England.

Carlton returned to Quebec to find himself under political attack for his failure to pursue his victory at Valcour Island. In the winter of 1777, Carlton was replaced by General John Burgoyne. The flamboyant "Gentleman Johnny" brought with him plans for a complicated three-pronged campaign. According to the plan, St. Leger, the British commander at Niagara was to push eastward along the Mohawk River to its juncture with the Hudson around Albany. General Howe, commanding the British forces in New York City, was to march northwards up the Hudson to Albany. Burgoyne himself would lead the British army in Quebec down the Champlain Valley and join the other two in Albany. Like the American plan to invade Canada, Burgoyne's plan required extensive coordination between commanders who were separated by many miles of hostile territory. In addition, Burgoyne's lines of communication and transportation would be stretched alarmingly thin. In this regard, Buygoyne followed the
advice of the American Tories who informed him that he would be able to obtain his supplies locally from the surrounding civilian populations. Also, Burgoyne's plan required the speedy reduction of three American strongholds: Ft. Stanwick on the Mohawk, West Point on the Hudson, and Ticonderoga on Lake Champlain. Finally, Burgoyne would have to coordinate his attack with General Howe who had unsuccessfully fought Burgoyne's appointment and was a bitter political enemy.

Burgoyne, at the head of an 8,000 man army, left St. John in June of 1777 and moved down the Champlain Valley to Crown Point. By the first days of July, the advance guard of his armies reached the southern end of the lake and had Ticonderoga in sight. The situation of General St. Clair, the American commander at Ticonderoga, was rapidly becoming desperate. His army consisted of slightly over 3,000 men, half of whom were Continental Army soldiers and the remainder were militiamen of dubious value. His force was barely adequate for manning both the defenses of the fort itself and the fortifications on the hills which dominated the stone fortress. In addition, the fort had been stripped of its heavy armament, which had been shipped to Washington in Cambridge during the winter of 1775. St. Clair's requests for supplies, especially powder and artillery, had been ignored both by the Congress and the surrounding states. On the night of July 5th, Burgoyne's men dragged artillery up the slopes of Mt. Defiance. St. Clair had neglected to fortify the position because he believed that the hill was too steep to mount artillery. The next morning the position of the Americans in the fort had become untenable. The British guns
on the mountain dominated the fortress and could easily enfilade any activity of
the garrison. That night St. Clair evacuated the fort moving his men across the
lake by boat. He continued to retreat to Ft. Edward on the Hudson River
(Luzader 1975:34).

Despite Burgoyne's almost leisurely conquest of Ticonderoga, his three-
pronged plan was already in trouble. As the Americans retreated, they destroyed
bridges and roads and felled trees across the path over which Burgoyne's army
would have to travel. It took the British 24 days to travel the 26 miles between
the lake and Fort Edward. Fighting the rough and swampy land, the mosquitoes
and black flies, Burgoyne's men did not reach the Hudson until July 30th.

While Burgoyne was on the march, events elsewhere were conspiring against
his campaign. St. Leger, marching along the Mohawk River, had been unable to
capture Ft. Stanwick. Despite inflicting a strong defeat on the Americans at
Oriskany, St. Leger's Indian allies became discouraged and left the siege which
had been mounted against the fort. The loss of his Indian allies cost St. Leger
almost half of his forces. Lacking confidence in his ability to continue the
siege on the fort and to march on Albany with his reduced force, St. Leger
returned to his base at Ft. Niagara. Howe, the British commander in New York
City, and Burgoyne's avowed enemy, had never received confirmation of the orders
for the march on Albany. He therefore chose to march the major part of his army
south to confront Washington. He assigned a smaller group of men under General
Clinton to march northward to link up with Burgoyne. Clinton was successful in
capturing the American stronghold at West Point, but was reluctant to march on
the American army at Albany without word from Burgoyne. Finally, Burgoyne found that intelligence concerning the allegiance of the local population to be inaccurate. Instead of flocking to support a British army, the local citizens refused to provide needed supplies. His supply lines stretching back to his base in Canada were unable to provide the support which his large army required. Pressed for supplies, Burgoyne sent two regiments of Hessians to Bennington where, intelligence informed him, the rebels were stockpiling supplies. On August 16th the Hessians were attacked and defeated by a force of militiamen under the leadership of General John Stark (Thompson 1942). The battle at Bennington cost Burgoyne over 1,000 men. In addition he would now have to fight without desperately needed supplies, and with an American army threatening his flank. What he did not realize was that an American army (rather than St. Leger) was moving in from the west, and that Clinton was still at West Point. In a desperate gamble, Burgoyne moved his forces to attack the main American army commanded by General Horatio Gates. He hoped to break through and link up with Clinton, who he believed to be in the vicinity of Albany. In a series of battles around Saratoga, the three American armies surrounded Burgoyne. Surrounded by rebel armies, unable to find supplies, and knowing that St. Leger and Clinton were not in Albany, Burgoyne surrendered.

Historians generally view the Battle of Saratoga and the subsequent surrender of Burgoyne's army as a turning point in the military struggle for American independence. It breathed new life into the American cause which had
fallen to a new low after Howe captured the American capitol at Philadelphia. It proved dramatically that Americans could meet and defeat the best soldiers of Europe. It was probably the crucial issue in persuading the French to establish a public alliance with the new American republic. The Burgoyne campaign marked a turning point in northern New England as well as for the American cause. It marked the last time that an army would use the area's waterways as invasion routes. Although disputes over boundaries would continue until the 1840's, open warfare never again would break out in the region. For the first time since before the coming of the Europeans, northern New England could look forward to a future of real peace.

B. Agricultural Development and Land Usage in Vermont and Western New Hampshire

1. Introduction

There had been some settlement in the northern New England area prior to Burgoyne's surrender. Following the French and Indian war, many townships had been surveyed and lots had been put up for sale by speculators both locally, and in the large seaport cities in the north. Despite these attempts to attract settlers, the few settlements that were established were generally located on the southern reaches of the Connecticut River. The danger of living in the line of march of invading armies, and a complicated and sometimes violent dispute over land titles in the area, made settlement unappealing. The period of the Revolution both ensured the military security of the area, and the admittance
of the State of Vermont settled the question of land ownership. Perhaps most importantly, the growing settlements in southern New England were quickly reaching the limits of the supply of land available for farming.

The factor which had most influenced the unique development of American society was the abundant supply of readily available farmland. This factor made it possible for any individual, regardless of wealth or station in life, to obtain a small farm. The abundant supply of land allowed American society to develop a unique ability to offer nearly universal social mobility into the middle class of small farmers. Early in its history, America had acquired a reputation as being the "Best Poor Man's Country" on the Earth. By the beginning of the eighteenth century, the middle class nature of American society was breaking away from its European traditions.

2. The Historical Background

(a) Land Settlement in New England 1763-1776

In the mid-eighteenth century, the ability to provide sufficient land for small farmers in New England was being threatened. In Massachusetts, Connecticut and Rhode Island, population growth was impinging on the supply of available land. Land prices began to rise beyond the reach of the poor, and parents were unable to supply sufficient land to provide a livable income for their children (Graven 1970:104). The key role which land played in American society caused New Englanders to look for available land outside the boundaries of the established settlements. Before the Revolution, two large speculating enter-
prises, the Wyoming and the Susquehanna Companies were settling New England immigrants in central Pennsylvania. In the 1770's another large group of New Englanders began to push up the Connecticut River settling the area between the Champlain Valley and both banks of the river. All of the towns within the study area in this region were settled between 1770 and 1785 (Hemmengway 1871).

This trend first emerged and reached its greatest influence in New England. The study area was physically and culturally tied to the rest of New England. The patterns of settlement and land usage which occurred in the area typify development throughout much of the northeast. It reflects the mainstream of New England social, political and economic experience. The new settlers generally bought land in the vicinity of kinsmen, or neighbors from the area from which they had emigrated. They brought with them methods of farming and land development which were characteristic of the older sections of New England.

(b) The Development of Subsistence Agriculture in northern New England 1776-1820

The settlement of land and the development of agricultural communities generally went through a fairly set sequence of stages. The first stage of development can be characterized as the subsistence agricultural stage. Generally a man would either personally examine an area, or inquire from friends or relatives settled in the area, before purchasing a lot. The large flood plains on either side of the many creeks and brooks which drain the mountainous terrain, were called intervales, and were the most highly prized farm-lands. After purchasing land, the settler would start out with either a horse
or a team of oxen in the late winter while crust on the surface of the snow and
the ice on the river allowed travel. Upon arrival, the farmer's first task was
to clear the fields which he wished to plant. The trees were either felled or
girded (stripped of a section of bark and allowed to die). After clearing some
land of trees, the settler would then build some kind of shelter for himself
and his livestock. Generally a rough lean-to would be constructed, and a "waste"
would be built to house the animals. Following the spring thaw, the new
settler would plant a crop, usually corn or wheat, amid the stumps of the
cleared trees. During the remainder of the growing season, the farmer would
work the crops, remove stumps and rocks from the fields, and build fences. This
cycle might continue for several years until the settler had either cleared his
entire purchase or reached the limit of his ability to farm (generally the
average amount a single man could work was either a horse or a team of oxen was
between 80-120 acres depending on the nature of the land). Sometime during this
period, the new settler would begin to construct a rough log cabin. Generally
logs would be selected of the same length and the ends would be worked square with
a broad axe. The walls of the cabin would be constructed by piling the logs on
top of each other. The logs would be secured by driving a wooden pin through the
squared portions of the logs which formed four corners of the cabin. Roofing
was generally produced by using strips of bark cut to size. Holes for the doorway
and several windows would be cut into the walls, and moss would be used to chink
the spaces between the logs of the walls. If the farmer was affluent he might
use glass in his windows, but usually a deerskin was stretched over the openings.
Sometimes a chimney of stone and mud was built, but often heat was provided by an open fireplace with the smoke escaping through a hole cut in the roof. Usually the floor of the cabin was dirt, but occasionally logs would be worked flat on one side and used as flooring (Thompson 1942).

(c) The Evolution of Commercial Agriculture in northern New England 1820-1865

The clearing of all the acreage which could be profitably farmed and the construction of more substantial buildings and storage facilities generally marked the transition between the subsistence agricultural stage, and the beginning of the commercial agricultural stage. Generally, most of the farms in an individual community were settled at roughly the same time. This is particularly true in Vermont and western New Hampshire where settlement occurred rapidly and the settlers tended to have migrated in family or neighborhood groups. Within several years most of the settlers in an area would be passing from the first to the second stage of agricultural development. The changes manifested by the transition were felt by the community at large as well as the individual farmer.

For the individual farmer, the transition would be marked by the addition of members to his household. If he had been married, his family, which generally had been living with other family members, would be brought to the new homestead. If he was single he could now feel secure enough to wed or to encourage other
relations to join him. In pre-industrial agriculture, productivity was closely related to the available work-force. With outside agricultural labor non-existent, or scarce and expensive, the inclusion of new family members to the work force was the only realistic way to ensure profitable farm production. The farmer's wife and children could help in working the fields or at least free the farmer from having to perform other necessary tasks. The additional freedom would allow the farmer to augment his income by producing maple syrup or potash and pearlash which were highly marketable. The increase in work force would produce a corresponding increase in productivity allowing the farmer to grow more than what was necessary to support himself and his family. Generally this surplus could be marketed or bartered for goods. The transition from subsistence to commercial farming was generally marked by the replacement of the rough cabin with a frame house and a barn to replace the "waste". The farmer might also use the surplus to purchase additional land, particularly if he had children, or some manufactured goods.

The transition from subsistence to commercial agriculture had an effect on the local community as well as the individual farmer. The creation of an agricultural surplus coincided with the creation of milling and transportation services. In addition, the new-found spending power of the farmer, created by the surplus, attracted additional economic activity into the area. Generally, in pre-industrial society, this activity took the form of artisans and craftsmen who catered to the needs of the surrounding agricultural community. In short,
the generation of a farming surplus was fundamental in encouraging the development of towns in the area (Main 1965).

The development of towns was somewhat unique in New England. Unlike other areas where the county was the basic political, social, and economic unit, New England adhered to the older English tradition of town government. The original charters of the New England colonies generally granted lands to townships rather than to individuals. A group of individuals would petition the court of the colony for a charter. Once granted the new charter specified a tract of land to be divided among the townspeople however they chose to distribute it (Greven 1970:53). This unique structure of town government encouraged the relatively early settlement of towns in New England. The immigrants who settled Vermont and western New Hampshire brought the tradition of town government with them. As a result of this unique New England tradition, towns in the area were generally settled relatively early in the subsistence agricultural stage of development.

Traditionally, the first structures in the town would be a church and a tavern. The tavern would double as a trading post allowing a farmer to purchase those goods which he required and could not make himself. Another New England tradition, a commitment to public education, encouraged the construction of a schoolhouse as soon as there were enough children in the surrounding area to support one. The transition to commercial farming in the area encouraged the construction of mills along the many creeks and rivers in the area. Grist mills
used the available water power to grind grain, and sawmills were built to exploit the white pine in the area and supply new construction in the surrounding farms and towns. This period also saw the construction of general stores to tap the increased wealth of the farmers in the vicinity. In addition artisans and craftsmen, who catered to the farmer's needs, set up shops in the towns. Blacksmiths and coopers, were the most popular, and depending on the proximity of major roads, wheelwrights, carpenters, tailors and other craftsmen might settle in the area.

(d) Industrial Development in the Nineteenth Century

This pattern of development is generally restricted to the study area from the Champlain Valley to the eastern bank of the Connecticut. The stage of subsistence agriculture occurred in this vicinity during the period beginning in the mid 1760's and stretching through the first decades of the nineteenth century. The commercial agricultural period began in the beginning of the nineteenth century and continued until the decade before the Civil War. During the mid-nineteenth century industrialization began to make an impact throughout the region. The chief agent of industrialization, the railroads, began to be constructed in the 1850's and reached a peak in the 1870's and 1880's. Despite the fact that northern New England was off the major railroad corridors between the east and the developing western lands, the railroad still had an effect in the region. The railroads made it feasible to exploit resources in the area which were previously inaccessible. Most notably, the granite quarries in
central Vermont and the timber industry around the Winooski River were developed. Textile mills were established using the cheap power provided by the rivers.

The new forms of economic activity which invaded the region in the last quarter of the nineteenth century produced changes in the local community. The new opportunities provided by industry freed people from agriculture, and the population of the towns grew. The railroads brought a previously unknown sense of geographic mobility which destroyed the isolation of many of the small towns.

C. Land Usage and the Exploitation of Forest Resources in Northern New Hampshire and Northern Maine

1. Introduction

The progression of development of the area from the Champlain Valley to the Connecticut River is typical of development in much of the United States and particularly the rest of New England. However the type of development which occurred in northern New Hampshire and northwestern Maine is unique. The initial agricultural development which was fundamental to the evolution of most other areas never occurred in this region. A unique type of land usage developed in northern New Hampshire and Maine as the result of several major factors: remoteness from the established population centers in New England, harshness of the climate and boundary disputes. The boundaries of the area remained a source of dispute between Canada and the United States long after the political situation in the rest of northern New England had achieved stability. The inaccuracy of maps available at the end of the eighteenth century left the
boundaries between Maine and Canada ambiguous. The Treaty of Paris signed in 1783 which ended the American Revolution and proscribed the northern border remained a source of conflict until the 1840's. Great Britian claimed the land running south as far as the present town of Houlton. This dispute over the northern boundary of Maine became known as the Aroostock War. Although open warfare never broke out over the issue, it remained a source of potential armed conflict until the signing of the Webster-Ashburton Treaty in 1842 which secured the present border on the St. John's River.

The long period of uncertainty over stability in the area combined with its remote location and harsh climate to retard settlement in the region. By the mid-nineteenth century, long after the western sections of northern New England had been settled, the land in northwestern Maine remained an unsettled wilderness owned by the state. About the same time, the government of the State of Maine was being pressured to sell the public lands in the hope of attracting settlers into the state. Between 1860 and 1872 a total of 5,400,000 acres of public domain were disposed of by the state. During this same period, the federal government was opening up the western territories for settlement through the Homesteading Act and the liberal land grants offered to the western railroads. As a result, the land in Maine had to compete for settlers with the new western territories which were made more accessible by the railroads, and which lacked the harsh climate of northern New England. When the public lands in Maine were sold, they did not go to settlers, rather they were bought up by local speculators
who wished to exploit the belt of white pine forest. Thus the area never went through the type of agricultural development and land usage patterns which characterized the western sections of northern New England, and which predominated in most of the rest of the northeast. The area never developed the long term stable small town settlements which was the natural product of agricultural land usage in other areas. Rather, northwestern Maine and northern New Hampshire developed a particular pattern of usage based on the exploitation of forest resources. Due to this unique pattern of land usage, permanent settlement never occurred in the area and it remains largely forested and dominated by industry dependent upon lumber.

Domination of the forest resources was dependent, not on land ownership, but rather on the possession of water rights on the main rivers. Until railroads entered the region in the beginning of the twentieth century, the only feasible way of moving large numbers of logs was to float or drive them down the rivers. The major log driving rivers were the Androscoggin River in northern New Hampshire, the Kennbec and the two branches of the Penobscot River which flow south to the coast of Maine, and the St. John which flows into Canada. There were log drives on other rivers in the region including the Connecticut and the Machias Rivers, but the ability to control the water level on major log driving rivers through a series of dams, was fundamental to the control of the timber resources.
2. The Historical Background

(a) Logging in New England - The Colonial Legacy

Timber was an important resource in New England since the earliest days of the colonial period. England is an island whose defense and prosperity has always been dependent upon the maintenance of a naval and commercial fleet. Before the advent of iron and steam, this fleet was dependent upon timber. Wooden ship construction required vast amounts of timber which were becoming increasingly scarce in England during the seventeenth century. The item most desperately needed by the English were tall, straight logs, devoid of any imperfections (Sanborn 1904:117). These logs were required by the shipbuilders for the huge masts needed on sailing vessels. Prior to settlement of the colonies, English shipbuilders obtained needed masts from the Baltic nations. This life-line was easily threatened by warfare which dominated the seventeenth century, and in addition, it was an expensive means of obtaining the vital masts. The English were therefore quick to exploit the tall white pines in the forests of New England. The Surveyor General of New England was required to make surveys of the forest and brand any tree which had the necessary characteristics with a cross. Under English law, any tree, even if it had not been branded, or whether it stood on crown land or private land, was reserved for the royal navy. The penalty for poaching royal navy masting trees was severe, and the law was a constant source of conflict between local inhabitants and royal officials.
(b) Long Log Timbering in North New England 1860-1890

Despite the early beginnings of the logging industry in New England, it was not until the period of economic growth following the end of the Civil War that full scale exploitation of forest resources in the area began. The high period of long log timber logging in Maine was from 1860 to 1890. During this period logs were generally used for timber; they were sawed at a large number of relatively small mills located in cities outside of the forested areas. Mills were centered at Bangor on the Penobscot, Berlin on the Androscoggin, Gardiner on the Kennebec, and Fredricton on the St. John.

After a period of trial and error, a system for logging evolved. The multitude of small mill owners did not control the timber, rather they would contract for delivery of a specific number of logs with the log driving companies which developed on each of the major driving rivers. The log drive companies would lease the land from local owners for its stumpage rights, and hire a boss to do the actual logging. The log driving companies were able to control the industry because they controlled the rivers (Smith 1972). Through a vast series of dams, the driving companies could control the flow of water in the rivers. They were able to use the water to maintain a high level of water necessary during the driving season to float the logs from the northern forests to the mills on the southern reaches of the rivers. The events surrounding the Telos Canal will help illustrate the critical role which control of river water played in the logging industry.
During the early twentieth century, the canal was constructed along the upper reaches of the Penobscot River. The canal was built to help transport logs from that region to the mills in Bangor. The Telos Canal diverted a large volume of water which normally flowed into the St. John River into the Penobscot. The result was that the level of the St. John River was reduced enough to make driving impossible. The mills at St. John and Fredericton suffered serious financial losses and several armed attempts were made to destroy the canal.

During the high period of logging in Maine, the techniques of the industry followed a seasonal pattern. In the late winter or early spring the mill owner, the log driving company, and the land owner involved in a particular venture would hire a surveyor to "cruise" a specific area. The surveyor would estimate the amount of lumber and the types of timber in the area, and log out the sites for the necessary camps and roads to be used in the operation. At least two roads were necessary in logging operations: a "tote" road to transport supplies to the camps, and a sled road to transport the cut timber from the forest to the nearest creek or river. If the surveyor's cruise showed that the area could be profitably logged, the log drive company would hire a boss to supervise the logging. The boss would hire a crew in the early summer who would then enter the woods. During the summer and fall the crew would construct the camp, clear out the roads, and make improvements in the creek to be used to transport the timber. The improvements might include removal of snags or rocks, widening of the banks, or clearing of creeks and brooks which fed into the waterway being used. The logging would begin in the winter when snow and frozen
ground allowed for easy movement of logs. Logs would be cut and transported to the frozen rivers on horse drawn slides. The slide roads would be built downhill and each night the road would be coated with water to provide a slick surface. Ruts were cut in the surface of the ice of the road which corresponded to the width of the runners on the sleds. The horses were not used to pull the heavily laden sleds, rather they were used to get the vehicles moving and to steer them. This method of transporting logs allowed each sled to haul massive amounts of timber from forest to river. Once at the river, the logs were either piled on to the river ice or stacked on the banks. At the river the logs would lie scaled or measured to insure the proper amount had been cut to fulfill the terms of the contract and to insure that the land owner received his proper payment for the stumpage rights. The logs would then be stamped with a mark to identify the individual mill to which they were consigned.

In the spring, when the thaw broke up the river ice, logs cut by all of the operations in the vicinity that winter would be driven to a central holding area, usually at a dam above the major driving areas. The logs would wait at these dams until fall rains increased the level of water in the rivers to a height sufficient for the drive.

When and if fall rains increased the level of water in the river, the log driving companies would drive all the logs contracted by all the mills on that river down stream. It was a dangerous business heavily dependent upon good weather and luck. If a sufficient amount of rain did not fall, millions of feet
of timber would be hopelessly marooned on river banks and shallows. A snag in
the river or piles of a bridge could cause a jam that would extend for miles
and would create a pile of logs which, at its face would reach a hundred feet
in height. If a jam did occur, the only way of unsnagging the logs was either
to pry them apart with the crow-bar-like peavey stocks or else blow them apart
with dynamite. Either way the job was risky and the log drivers sustained an
appalling rate of casualties. If the drive successfully reached its destination
before the freeze closed the rivers, they would be herded into booms which were
stretched across the rivers at big mill towns. The booms consisted of logs,
chained together between pylons constructed of piles of stone in a wooden frame.
At the booms, logs would be separated according to stamps which indicated their
ownership. Each group of logs with a particular stamp would be rafted together
with chains and floated to the appropriate mill (Pike 1967).

(c) Industrialization, Consolidation, and The Rise of the Wood Pulp
Industry in Northern New England 1890-1940

Several events occurred at the end of the nineteenth and the beginning of
the twentieth century which altered the standard techniques of the logging
industry. The first was the shift in production from lumber to the manufacture
of wood pulp products which began in the 1880's. There were several factors
which conspired to bring about this transition. The first was the development
of the industrial technology necessary to produce paper from wood pulp. Another
important factor was the growing scarcity of the white pine on which the timber
industry was dependent. Wood pulp was manufactured out of other soft wood species
which were still abundant in the Maine woods. In addition, timber mills were particularly hard hit by the business depression in the 1870's. At the same time, several years of particularly bad weather and several disastrous fires had caused mills to close. In itself, the shift from timber to pulp production did not cause a profound effect upon logging in Maine. Pulp was cut into standard four foot lengths before they were driven down river. The choice of location for new mills did have profound repercussions throughout the entire industry. Paper companies were owned by large corporations which were becoming the dominate form of management in America during the second half of the nineteenth century. Unlike the timber mills, which were generally owned by local merchants, paper companies located their mills upstream where they could use rivers to generate power necessary to run the mills. Control of rivers in the region yielded control over land, and by the beginning of the twentieth century large paper companies were the biggest land owners in northwestern Maine and northern New Hampshire.

The other factor which radically changed the logging industry was the introduction of new technology which replaced the traditional logging technique. Steam powered, tracked lombards were introduced at the beginning of the twentieth century and later diesel-powered tractors replaced the horse and sled. The construction of railroads, and more significantly, the later construction of truck roads marked the end of the log draws on the rivers. The roads and the replacement of axe and hand saw with chain saw allowed lumberjacks to commute to
work each day and removed the need for logging camps. In the fifty years between 1880 and 1930 the logging industry changed from the classic period of lumberjacks, logging camps and river drives to the corporate uniformity of large-scale paper manufacturers.
III. A FINAL THEME: THE ACADIAN MIGRATION 1755

A final theme, which must be included in the historical background of northwestern Maine, is the Acadian migration. During the years leading up to the French and Indian War, the English governor of Nova Scotia became alarmed at the refusal of French speaking Acadian to take sides in the impending conflict. In 1755 the Acadians who refused to take an oath of allegiance to England were forcibly expelled from their homes at Ft. Latour (now St. John). Many were exiled to English colonies as far south as Massachusetts. Others escaped and scattered in different directions, some across the Bay of Fundy to the mouth of the St. John's River where they worked their way across the wilderness to the St. Lawrence, and finally reached Quebec. Another large group fled up the St. Johns River to St. Anne des Pays Bas (now Fredericton N.B.). On January 28, 1759, a detachment of Rangers under the command of Moses Hazen burned the village at St. Anne and massacred most of the inhabitants. The survivors of the British attack marched upstream looking for an area on the river which would be secure from attack by the Royal Navy. They proceeded past Great Falls, which marked the limit of possible navigation on the St. John's River, and settled at the current site of Madawaska. Over the next century, the Acadian settlement extended eastward from Madawaska on both sides of the river. Sometime between 1840-1850, the descendants of the Acadian exiles settled in the region between Ft. Kent and St. Francis. Currently, there remains a large French speaking Acadian population
in the Ft. Kent-St. Francis area. These descendants of the settlers expelled from Nova Scotia in 1755 have remained largely separated from the English speaking majority in the state. In addition, they have retained a unique cultural traditional and historical heritage which distinguishes them from the French speaking inhabitants in Canada. There has been a failure of the historians to study this large and unique cultural and linguistic enclave in northern Maine. As a result, a substantive effort should be made to preserve existing historical resources related to this community.
Blum, Jerome  

Greven, Phillip J.  
Cornell University Press, Ithaca, N.Y.  

Hemengway, Abby M.  
1871 The Vermont Historical Gazeteer, published by author, Burlington, 
Vermont.  

Hill, Christopher  

Luzader, John  
1975 Decision on the Hudson, the Saratoga Campaign of 1777. National 
Park Service, Washington, D.C.  

Main, Jackson T.  
1965 The Social Structure of Revolutionary America. Princeton University 
Press, Princeton, N.J.  

Malone, Dumas  

Pike, Robert E.  

Sanborn, Frank B.  
1904 New Hampshire, an Epitome of Popular Government. Houghton, 
Mifflin and Co., Cambridge.  

Smith, David C.  
Press, Orono.  

Starkey, Glenn W.  
1920 Maine Its History, Resources and Government. Silver Burdett Co., 
New York.  

Thompson, Charles M.  
APPENDIX D

INFORMANTS: CONTACTED AND REFERRED
Background research indicated the following individuals capable of supplying information regarding cultural resources in the project area. Individuals marked by an asterisk (*) were contacted and interviewed. The remainder were not contacted, but are presented here for future use.
NEW HAMPSHIRE INFORMANTS

William K. Ackroyd, President
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Carolyn Allbright, Librarian
Lisbon Public Library
Lisbon, NH

Emil W. Allen, Jr., State Librarian
New Hampshire State Library
20 Park Street
Concord, NH 03301

Mary Allen, Librarian
Enfield Free Public Library
Main Street
Enfield, NH 03748

Annis, Genevivie
Errol, N.H.
Local Historian

Association of Historical Societies
of New Hampshire
Durham, NH 03824

* Bailey, Dennis
Colebrook, N.H.
Post Office Worker

* Barn, Mr.
Whitefield, N.H.
Selectman

Barnet, James
Errol, N.H.
Local Historian

Baum, Eldros
Colebrook, N.H.
Local Historian

Bearchemin, Virginia, Librarian
Pittsburg Public Library
Pittsburg, NH 03592

Blodger, Isabell, Librarian
Hebron Public Library
Hebron, N.H. 03241

Branscombe, Thelma, Librarian
Lincoln Public Library
Church Street, Box 98
Lincoln, N.H. 03251

Brown Co.
Research and Development Library
Berlin, N.H. 03570

Brown, Mrs. Floyd, Librarian
Bethlehem Public Library
F.O. Box 265
Bethlehem, N.H. 03574

* Burrill, Jane, Librarian
Monroe Public Library
Monroe, N.H.

* Burrill, Larkin, Postmaster
Monroe, N.H.

Cady, Louise M, Librarian
Canaan Town Library
RD #1
Canaan, N.H. 03741

Carrier, Marjorie, Librarian
North Stratford Public Library
Box 193
North Stratford, N.H. 03590

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Center Harbor, N.H. 03226

Chairman
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Dartmouth College
Hanover, N.H. 03755

Chairman
Department of History
Franconia College
Franconia, N.H. 03580

Chairman
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Franklin Pierce College
Rindge, N.H. 03461
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Chairman
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Nathaniel Hawthorne College
Antrim, N.H. 03440

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Plymouth, N.H. 03264

Chairman
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Nashus, N.H. 03060

Chairman
Department of History
Saint Anselm's College
Manchester, N.H. 03102

Chatfield, Robert W., Director
Frank S. Dipietro Library
College Road
Rindge, N.H. 03461

* Chesley, Dennis, Director of Research
New Hampshire Archaeological Society
RFD #8
Concord, N.H.

Clifford, Joan, Librarian
Orford Social Library
P.O. Box 163
Orford, N.H. 03777

Cole, Lois, Local Historian
RFD #1
Monroe, N.H.

Constine, Mrs. Stanley, Local Historian
Lancaster, N.H.

Cook, Mary Jane, Librarian
Hanover Town Library
Hanover, N.H. 03750

Copeley, William N., Assistant Librarian
New Hampshire Historical Society Library
30 Park Street
Concord, N.H. 03301

Cross, Mrs. Michael, Librarian
Groveton Public Library
Northumberland, N.H. 03582

Dean, Steve, Local Historian
Whitefield, N.H.

* Divan, Dick, Postmaster
Errol, N.H.

Doran, Myla, Librarian
Minot-Sleeper Library
P.O. Box 126
Bristol, N.H. 03222

Eaton, Jeffrey, President
Weare Junior Historical Society
Weare, N.H. 03281

Emery, Katherine, Librarian
Stark Public Library
RFD 1
P.O. Box 126
Groveton, N.H. 03582
NEW HAMPSHIRE INFORMANTS

Evans, Connie, Librarian
Twin Mountain Public Library
Main Street
Charlestown, N.H. 03603

Farrer, Dorris, Librarian
Gorham Public Library
Park Street
Gorham, N.H. 03581

Foss, Fred, Local Historian
RFD #1
Colebrook, N.H.

* Gates, Don, Chief Forester
  St. Regis Paper Company
  West Stewartstown, N.H.

* Gifford, Dr., Amateur archaeologist
  Colebrook, N.H.

Gilmen, George
Conn. Department of Resources and
  County Development
Concord, N.H.

Grover, Arlene, Librarian
Errol Town Library
P.O. Box 7
Errol, N.H. 03579

Hall, Lucille, Librarian
Holderness Free Library
Monument Square, Box 355
Holderness, N.H. 03049

Hamlin, Inez, Librarian
Berlin Public Library
270 Main Street
Berlin, N.H. 03570

Hanover Historical Society
Webster College Museum
32 N. Main Street
Hanover, N.H. 03755

Heald, Frances
Littleton Historical Society
Littleton, N.H.

* Heald, Mary
  Littleton Historical Society
  Littleton, N.H.

* Harp, Elmer
  Department of Anthropology
  Dartmouth College
  Hanover, N. H.

Holz, Sandra, Librarian
Whitefield Public Library
High Street
Whitefield, N.H. 03598

Hucksoll, A.C., Director
Abbie Greenleaf Memorial Library
Franconia, N.H. 03580

* Hume, Gary, State Archaeologist
  Department of Anthropology
  University of New Hampshire
  Durham, N.H.

Hunt, Evelyn, Librarian
Stewartson Public Library
P.O. Route 3
Colebrook, N.H. 03576

Hall, Shirley, Librarian
Pike Library Association
Haverhill, N.H. 03780

Ham, Isabelle M. Librarian
Thornton Public Library
RFD 1
Campton, N.H. 03223

Hamlin, Inez, Librarian
Berlin Public Library
270 Main Street
Berlin, N.H. 03570

Ingles, E. Helen, Curator
Sandwich Historical Society
Maple Street
Center Sandwich, N.H. 03227

Johnson, Emma, Librarian
North Haverhill Town Library
Haverhill, N.H. 03744

Jones, Beatrice M., Librarian
Joseph Patch Library
Box 213
Warren, N.H. 03279

Judge, Mrs. Stanley, Librarian
Shelburne Public Library
Star Route 30
Gorham, N.H. 03581

Keller, George D., President
Effingham Historical Society
Rt. 153
Effingham, N.H. 03830
NEW HAMPSHIRE INFORMANTS

Keneson, Muriel, Librarian
Byron G. Merrill Library
Rumney, N.H. 03266

Kinney, Norman, Local Historian
Littleton, N.H.

Kirkpatrick, Allan M., Chairman
Ashland Historical Society
Whipple House
Pleasant Street
Ashland, N.H. 03217

Latham, Dean of Libraries
Baker Memorial Library
Dartmouth College
Hanover, N.H. 03750

Leighton, Virginia
Easton Free Public Library
Rte 1
Easton, N.H. 03580

Leonard, Verah, Librarian
Woodsville Free Public Library
School Street
Woodsville, N.H. 03785

Lookwood, Priscilla, President
Canterbury Historical Society
Old Tilton Road
Canterbury, N.H. 03224

Love, Dorothy, Librarian
Orford Free Library
Orford, N.H. 03777

Lunik, Mary, Director
Colebrook Public Library
Colebrook, N.H.

Lynch, Mary, Director
Colebrook Public Library
Main Street, Box 46
Colebrook, N.H. 03743

Mansell, Jean E., Librarian
Lebanon Public Library
9 East Park Street
Lebanon, N.H. 03766

*Mayhew, Bob, Town Manager
Groveton, N.H.

McDermand, Robert V, Reference Librarian
Herbert H. Lamson Library
Plymouth State College
Plymouth, N.H. 03264

Menge, Geneva, Librarian
Lyme Town Library
Lyme, N.H. 03768

Mennel, Dr. Robert, Chairman
Department of History
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Merril, Hubert, Local Historian
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Miller, Barbara G., Librarian
Weeks Memorial Library
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Lancaster, N.H. 03584

Miller, Cynthia, Librarian
New Hampshire State Library
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Littleton, N.H. 03561

* Mountain, Mr.
Groveton Paper Company
Groveton, N.H.

Nevers, Mrs. Wilbur C., Librarian
Jefferson Public Library
RFD 1, Box 218
Jefferson, N.H. 03583

Nute, Helen E., President
Conway Historical Society
Lord House
Main Street
Conway, N.H. 03818

Page, John F., Director
New Hampshire Historical Society
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Concord, N.H. 03301
NEW HAMPSHIRE INFORMANTS

*Paradise, Milton, Postmaster
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Platt, Frances, Librarian
Ashland Town Library
Ashland, N.H. 03217

*Postmaster
Pittsburg, N.H.

* Postmaster
West Stewartstown, N.H.

President
Centre Harbor Historical Society
Box 74
Centre Harbor, N.H. 03226

President
Hudson Historical Society
1 School Street
Hudson, N.H. 03051

President
Littleton Area Historical Society
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Littleton, N.H. 03561

Pulsifer, Laura, Librarian
Campton Grange Town Library
RFD 3
Plymouth, N.H. 03264

* Reynolds, Mrs. Elgin, Curator
Atkinson Historical Society
Academy Street
Atkinson, N.H. 03811

Richards, Gerald
RD #1
Colebrook, N.H.

Robbins, Ellen, Director
Littleton Public Library
Littleton, N.H. 03561

Roff, Edmund L., President
Tamworth Historical Society
Tamworth Village, N.H. 03886

Rupert, Mary Ann, Reference Librarian
Howe Library
13 East South Street
Hanover, N.H. 03755

Salisbury, Eunice V, Librarian
U.S. Army Cold Regions Research and Engineering Laboratory
Lyme Road, Box 282
Hanover, N.H. 03755

* Sargent, Howard
Office of the State Water Supply and Pollution Control
Concord, N.H.

Senko, Barbara, Librarian
Wiggin Memorial Library
Portsmouth Avenue, Box 201
Stratham, N.H. 03885

Serven, Margaret, Librarian
Laura Johnson Memorial Library
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North Stanford, N.H. 03590

Shatney, Rudolph, Local Forester
Clarksville, N.H.

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Smith, Thelma, Librarian
Dummer Public Library
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Speed, Perley E, Librarian
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Court Street, Box 36
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Spencer, Sarah T., President
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Steenburgh, A.H., President
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NEW HAMPSHIRE INFORMANTS

Stevens, Paul, Local Historian
Groveton, N.H.

Stevens, Wilson, Local Historian
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Sullivan, Marion L., Librarian
Richardson Memorial Library
Sugar Hill, N.H. 03585

Switser, Edith, Librarian
Dalton Public Library
RFD 2
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*Town Manager
Lancaster, N.H.

Walker, Beverly, Librarian
Dorchester Community Library
Rumney, N.H. 03266

Willey, Wilbur, Local Historian
Littleton, N.H.

Wilson, Gregory, Director
Francis Oakes Library
Franconia College
Franconia, N.H. 03580

*Wilson, Linda Ray
Director of Historic Preservation
Department of Resources and Economic Development
Concord, N.H.

Uritz, Jean, Librarian
Cook Memorial Library
Tamworth, N.H. 03886
MAINE INFORMANTS

Allen, Nan, Librarian
Brooksville Free Public Library
Brooksville, Me 04617

Atchinson, Helen K, Director
Cary Library
Houlton, Me 04730

*Beadley, Robert, Architectural Historian
Maine Historic Preservation Commission
Augusta, Me

*Bonnichson, Robson
Department of Anthropology
University of Maine
Orono, Me

*Bourque, Bruce, Archaeologist
Maine State Museum
Augusta, Me 04333

Breton, Adrian J., President
Moosehead Historical Society
Box 512
Greenville, Me 04441

Broderick, Donald C., Director
Learning Resources Center
University of Maine at Augusta
Augusta, Me 04330

Bryant, Marjorie H., Director
Wilton Free Public Library
104 Main Street, Box 454
Wilton, Me 04294

Butler, Natalie S., Secretary
Red Schoolhouse Museum
Routes 2 and 4
Farmington, Me 04938

Butterfield, Margaret D., Librarian
Caribou Public Library
30 High Street
Caribou, Me 04736

Buxton, Helen L, Librarian
Skowhegan Free Public Library
5 Elm Street
Skowhegan, Me 04976

Chairman
Department of History
Bates College
Lewiston, Me 04240

Chairman
Department of History
Bowdoin College
Brunswick, Me 04011

Chairman
Department of History
Colby College
Mayflower Hill
Waterville, Me 04901

Chairman
Department of History
Husson College
1 College Circle
Bangor, Me 04401

Chairman
Department of History
Nasson College
184 Main Street
Springvale, Me 04083

Chairman
Department of History
Ricker College
Houlton, Me 04730

Chairman
Department of History
Saint Francis College
Pool Road
Biddleford, Me 04005

Chairman
Department of History
Saint Joseph's College
North Windham, Me 04062

Chairman
Department of History
Unity College
Unity, Me 04988
MAINE INFORMANTS

Chairman
Department of History
Thomas College
West River Road
Waterville, Me 04901

Chairman
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University of Maine
Portland, Me 04103

Chairman
Department of History
University of Maine at Farmington
Farmington, Me 04938

Chairman
Department of History
University of Maine at Ft. Kent
Pleasant Street
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Chairman
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University of Maine at Machias
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Chairman
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Chasse, Geraldine P., President
Madawaska Historical Society
Library Building
Main Street
Madawaska, Me 04756

Churchill, Ed, Architectural Historian
Maine State Museum
Augusta, Me

Correveau, Ray, Amateur Archaeologist
Jackman, Me.

Connors, Jim, Local Historian
St. Francis, Me.

Craig, Gladys, Librarian
Ashland Community Library
Ashland, Me 04732

Cyr, Carol A, Director
Abel J. Harneault Memorial Library
303 Main Street
Van Buren, Me 04785

Damm, Robert L, Director
Maine State Museum
State House Complex
Augusta, Me 04330

Deering, Marjorie M., Librarian
Newport Public Library
42 Main Street
Newport, Me 04953

DiPietro, Joyce, Librarian
Coolidge Library
Solon, Me 04979

Director
Franklin Historical Society
Franklin, Me 04634

Director
Nylaner Museum
393 Main Street
Caribou, Me 04736

Director
Patten Lumbermen's Museum
Shin Pond Road
Patten, Me 04765

Dunkin, George L., President
Daver-Foxcraft Historical Society
11 Harrison Avenue
Daver-Foxcraft, Me.

Dunnels, Dorothy, Librarian
Acton Public Library
Acton, Me. 04001
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<tr>
<th>Name</th>
<th>Title/Role</th>
<th>Institution/Location</th>
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<td>Dyer, Rosemary</td>
<td>Librarian</td>
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<td>151 Main Street</td>
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<td>* Elliot, Mr. Curator</td>
<td>Librarian</td>
<td>Lumberman's Museum</td>
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<td>Ellison, Catherine K.</td>
<td>Librarian</td>
<td>Milo Free Public Library</td>
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<td>Field, Hope</td>
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<td>Fox, Ethel W.</td>
<td>Librarian</td>
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<td>Gardiner, Tom</td>
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<td>* Hall, Austin</td>
<td>Retired Logger</td>
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<td>Hamilton, Edwina</td>
<td>Librarian</td>
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<td>Haneycutt, Arlene</td>
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<td>Hartman, Herb</td>
<td>Amateur Archaeologist</td>
<td>Department of Parks and Recreation</td>
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<td>Hathaway, Clara</td>
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<td>Hetile, William</td>
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<td>Aroostock Historical &amp; Cultural Museum</td>
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<td>Holden, Margaret</td>
<td>Amateur Archaeologist</td>
<td>Clayton Lake, ME</td>
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<td>Houle, Jeane</td>
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<td>12 Old Point Avenue</td>
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<td>Hyde, William</td>
<td>President</td>
<td>Aroostock Historical and Art Museum</td>
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<td>Ingalls, Arthur D.</td>
<td>President</td>
<td>Nordica Memorial Association</td>
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<td>Inman, Joseph P.</td>
<td>Director</td>
<td>Ricker College Library</td>
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<td>Isaacson, Dorris A.</td>
<td>President</td>
<td>Maine League of Historical Societies</td>
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<td>10 Brann Avenue</td>
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<td>Lewiston, ME 04240</td>
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<tr>
<td>Ives, Sandy</td>
<td>Expert on Maine Logging Industry</td>
<td>University of Maine at Orono</td>
</tr>
<tr>
<td>Jardine, Myrtle</td>
<td>Librarian</td>
<td>Washburn Memorial Library</td>
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<td>P.O. Box 175</td>
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<td>Jeffrey, William H.</td>
<td>Chairman</td>
<td>Department of History</td>
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<td>University of Maine at Orono</td>
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<td>Kaulback, Louise</td>
<td>Librarian</td>
<td>Boise Cascade Paper Company</td>
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<td>Rumford, ME 04276</td>
</tr>
</tbody>
</table>
MAINE INFORMANTS

Kelley, Mrs. Arthur, Local Historian  
St. Francis, Me.

Keniston, Virginia D., Librarian  
Bethel Library Association  
Broad Street  
Bethel, Me 04217

Lane, Sophie May, Librarian  
Norridgewock Free Library  
Worridgewock, Me 04957

* Leighton, Allan  
Seven Island Land Company  
Bangor, Me

Learned, Margaret, Librarian  
Andover Public Library  
Andover, Me 04216

Libby, Bessie B., Director  
Pittsfield Public Library  
89 Main Street  
Pittsfield, Me 04967

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McBridley, Charles, Retired logger  
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McDonald, Tom, Local Historian  
Eustis, Me

* McKay, Robert G  
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Orono, Me

McLeod, Louise M, Director  
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Limestone, Me 04750

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Seven Islands Land Company  
Bangor, Me

Mitchell, Elaine R.  
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*Milen, Mr., Postmaster  
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Morris, Gerald E., Director  
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Mundy, Mr. James H., Director  
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*Nadeau, Dawn, Local Historian  
St. Francis, Me

Nadeau, Rosalie, Local Historian  
St. Francis, Me

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Ouellet, Willie  
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MAINE INFORMANTS

*Paradise, Howard, Amateur Archaeologist
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Paradise, Roger, Expert on Acadian History
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*Peaely, Ash
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Allagash, Me

Pellitier, Frank, Expert on Maine Logging Industry
Patton, Me

Pelletier, Tom, Local Historian
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Orono, Me

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Patton, Me

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Sealey, John C., President
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Maine Historic Preservation Commission
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Box 240
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Sibley, Richard P., Jr., Director
Millinocket Memorial Library
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Millinocket, Me 04462

*Smith, David, Expert on Maine Lumbering Industry
University of Maine at Orono

*Sousy, Roland
Allagash, Me

Stimpson, Anne D., Librarian
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Presque Isle, Me 04769

Tourtillotte, Barbara, Librarian
Thomas Free Library
Howland, Me 04448
MAINE INFORMANTS

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Greater Rumford Area Historical Society
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White, Nichols Amateur Archaeologist
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Wiscasset, Me.

York, Emma R., Librarian
Phillips Public Library
Pleasant Street
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VERMONT INFORMANTS

Abbott, Laura P., Librarian
Vermont Historical Society Library
Pavilion Building
Montpelier, Vt 05602

Agard, Robert M., Director
Corssett Library
Bennington College
Bennington, Vt 05201

Barndrafe, James L., President
Reading Historical Society
Reading, Vt 05062

Bartlett, Mrs. Robert S., President
Historical Society of Marlboro
Main Street
Marlboro, Vt 05344

Bassett, T.D. Seymour, Curator
Chittenden County Historical Society
Bailey Library
University of Vermont
Burlington, Vt 05401

Beard, Bernice, Local Historian
Star Route
Barre, Vt

Bennett, Robert M., Vice President
H.A. Manning Company
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81 Rockingham Street
Burlington, Vt 05401

Bess, Gordon W., President
Danville Historical Society
Box 97
Danville, Vt 05828

Bissex, Henry, Local Historian
Plainfield, Vt

Bixby, Bernice, Librarian
Essex Free Library
Essex, Vt 05451

Bresnahan, Villa, Librarian
Gilman Public Library
Gilman, Vt 05904

Brown, John L, Vice President
H.A. Manning Company
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Burlington, Vt 05401

Burnap, Virginia, Local Historian
Guildhall, Vt

Burns, Anna H., Librarian
William H & Lucy F Rand Memorial Library
North Troy, Vt 05859

Carlisle, Lillian, Local Historian
Essex, Vt

Browning, Darrell
Lyndonville State College
Lyndonville, Vt

Browning, Norma, Librarian
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Champlain College
Burlington, Vt 05401

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Johnson, Vt 05656

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Lyndon State College
Lyndonville, Vt 05851

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Marlboro, Vt 05344

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Northfield, Vt 05663

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Clark, Della, Librarian
Arvin A. Brown Library
Richford, Vt 05476

Clark, Laura, Librarian
Ryegate Corner Public Library
Ryegate, Vt 05042

Clements, Roland, Local Historian
West Topsham, Vt

Cole, Arvena, Librarian
Guildhall Public Library
Guildhall, Vt 05905

Cushing, Irene, President
Bethel Historical Society
Cushing Avenue
Bethel, Vt 05032

Davey, Hope, Local Historian
Waterbury, Vt

*Deering, Agnes, Postmaster
Guildhall, Vt

Delfausee, Ellen K, Director
Winooski Memorial Library
19 E. Spring Street
Winooski, Vt 05404

DePew, Laura, Librarian
Montgomery Free Library
Montgomery Center, Vt 05471

Derby, Catherine, Librarian
North Hero Public Library
North Hero, Vt 05474
VERMONT INFORMANTS

Dickey, Laura, Librarian
Bradford Public Library
Main Street
Bradford, Vt 05033

Dumville, James, Curator
Royalton Historical Society
South Royalton, Vt 05068

Dumville, John, Local Historian
Royalton, Vt

Durkee, Douglas W., Director
Green Mountain College Library
College Street
Poultney, Vt 05764

Edwards, Mrs. Harley, Local Historian
Groton, Vt

Elliott, Jan, Librarian
Barton Public Library
Barton, Vt 05822

Emerson, Frederica, Librarian
Dorothy Alling Memorial Library
Williston, Vt

*Emerson, Sterling, D., Director
The Shelburne Museum
Route 7
Shoreham, Vt 05770

Estes, Jessie B., Librarian
Poultney Public Library
Poultney, Vt 05764

Ezerman, Robert, Planning Commission
Williston, Vt

*Farrington, Warren, Warden
Groton State Forest
Peacham, Vt

Fell, Mary B., Coordinator
Jericho-Underhill Library Coop
Underhill, Vt 04589

Fisher, Ed, Local Historian
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St. Johnsbury, Vt

Fog, Pete, Local Historian
Guildhall, Vt

Foley, Allen R, President
Norwich Historical Society
Norwich, Vt 05055

Foster, Marilyn, Librarian
Swanton Public Library
Swanton, Vt 05488

Fuller, Martha, Librarian
Jericho Town Library
Jericho Center, Vt 05465

Gallagher, Suzanne
Samuel Read Hall Library
Lyndon State College
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Geary, Kathleen A, Director
Fletcher Free Library
246 Main Street
Burlington, Vt 05401

Gibson, Alec, Amateur Archaeologist
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Gonyon, Sr. Jeanne M, Librarian
Carmelite Monastery Library
Beckley Hill
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Newark Public Library
RFD
West Burke, Vt 05871

Griggs, Marion L, Librarian
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*Hoffman, Henrietta
Waterbury Public Library
Waterbury, Vt

Holt, Linnian, Librarian
Jones Memorial Library
Orleans, Vt 05860

Hood, Marrion G, Director
Lanpher Memorial Library
Hyde Park, Vt 05655

Howlett, Amy, Director
St. Albans Free Library
Maiden Lane
St. Albans, Vt 05478

*Huntington, Ms., Post Office Worker
Marshfield, Vt

Hyde, Irena, Librarian
H.F. Brigham Free Library
Bakesfield, Vt 05441

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Richmond Free Library
Richmond, Vt 05477

Jacobs, Dr. Travis Beal, Chairman
Department of History
Middlebury College
Middlebury, Vt 05753

Johnson, Shirley, President
Vershire Historical Society
Vershire, Vt 05079

Judge, Louisa, Local Historian
Williston, Vt

Kebabina, Paul B, Director
Guy W. Bailey Memorial Library
University of Vermont
Burlington, Vt 05401

King, Katherine, Librarian
Tenney Memorial Library
Newbury, Vt 05051

Kneeland, Marjorie H., Librarian
Fairfax Community Library
Box 165
Fairfax, Vt 05454

Knowlton, Esther, Librarian
Goodrick Memorial Library
Newport, Vt 05855

Laflam, Eleanor, Librarian
Charles D. Brainard Public Library
West Danville, Vt 05873

Laliberte, Muriel, Librarian
Grand Isle Free Library
Grand Isle, Vt 05458

Lambert, Ora Marie, Librarian
Sarah Carpenter Memorial Library
Hinesburg, Vt 04561

*Lamoureux, Louis A., Town Clerk
Peacham, Vt

La Bombard, Madeline O, Librarian
Isle La Motte Free Library
Isle La Motte, Vt 05463

LaPlante, Ola, Librarian
Lowell Public Library
Lowell, Vt 05847

Latham, Charles, President
Thetford Historical Society
Thetford, Vt 05074

Leyden, Diane, Librarian
South Hero Community Library
Arthur Landon Memorial Library
South Street
South Hero, Vt 05486
VERMONT INFORMANTS

Lopata, Linda, Assistant Librarian
Shelburne Museum Research Library
Shelburne Museum Inc.
Shelburne, Vt 05482

*Louis, Ken, Town Clerk's Office
Lunenburg, Vt

Machell, Anita, Librarian
Brainard Memorial Library
RFD 2
St. Johnsbury, Vt 05819

Magoon, Coralie, Librarian
Chittenden County Regional Planning
Commission Library
Box 108
Essex Junction, Vt 05452

Marcy, Jean F., Director
St. Johnsbury Athenaeum Inc.
30 Main Street
St. Johnsbury, Vt 05819

McCrossan, Dr. John A, State Librarian
111 State Street
Montpelier, Vt 05602

*McDonald, Ernest, Postmaster
Plainfield, Vt

*McLuckie, Jane, Architectural Historian
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Pavilion Building
Montpelier, Vt

Mears, Mark, Local Historian
Marshfield, Vt

Miller, Barbara, Librarian
Weeks Memorial Library
Main Street
Jamestown, Vt

Molleur, Jacqueline, Librarian
Greensboro Free Library
Greensboro, Vt 05841

Moore, Erlene L, President
Paacham Historical Society
Paacham, Vt 05862

Morrissey, Charles T, Director
Vermont State Historical Society
State Street
Montpelier, Vt 05602

*Neudorfer, Giovanna, State Archaeologist
Division for Historic Preservation
Montpelier, Vt 05602

Nevers, Mrs. Wilbur C, Librarian
Jefferson Public Library
RD 1, Box 218
Jefferson, NH 03583

Nevins, John P, Director
Howard and Amy Rice Library
Marlboro College
Marlboro, Vt 05344

*Newton, Ethan, Director
Brownhall Library
Essex Junction, Vt

Nielson, Anna, Local Historian
Star Route
Barre, Vt

Nies, Kathryn, Librarian
Brown's River Library
Jericho Corners, Vt 05465

Noble, Paula, Librarian
Granby Public Library
Granby, Vt 05840

Osgood, William, Librarian
Center for Northern Studies Library
Wolcott, Vt 05680

Oustinoiff, Helen, Local Historian
Williston, Vt

Paquette, Marion, Librarian
Alice W. Ward Memorial Library
Canaan, Vt 05903

Parker, Nancy, Librarian
Johnson Public Library
Johnson, Vt 05656
VERMONT INFORMANTS

*Pinney, William D
Vermont Division of Historic Preservation
Pavilion Building
Montpelier, Vt

Popecki, Jeane, M, Director
Champlain College Library
371 Maple Street
Burlington Vt 05401

Popecki, Joseph, Local Historian
St. Michaels College Library
Essex, Vt

Post, Alice, Secretary
Waterbury Historical Society
Waterbury, Vt 05677

President
Bradford Historical Society
Box 92
Bradford, Vt 05033

President
Island Pond Historical Society
Island Pond, Vt 05846

President
Middletown Springs Historical Society
Middletown Springs, Vt 05757

President
Missisquoi Valley Historical Society
North Troy, Vt 05859

President
Poultney Historical Society
Poultney, Vt 05764

President
St. Albans Historical Society
109 Congress Street
St. Albans, Vt 05478

President
Weston Historical Society
Weston, Vt 05161

Randa, Frances B (Mrs.)
Peacham Library
Peacham, Vt 05862

Ransdell, Clarence
Guildhall, Vt

Raymond, Kenneth, Director
John Dewey Library
Johnson State College
Johnson, Vt 05856

Ready, Sr. Mary, Director
Trinity College Library
Trinity College
Burlington, Vt 05401

Reed, Howard, Director
Fairbanks Museum of Natural Science Library
83 Main Street
St. Johnsbury, Vt 05819

Reuter, Violet E., Librarian
Groton Free Library
Groton, Vt

Richardson, Charles, Local Historian
RD #2
Barre, Vt

Richardson, Kermit
RD #2
Barre, Vt

Rogers, Helen, Librarian
Hitchcock Museum and Library
Westfield, Vt 05874

Rowell, Joan, Local Historian
Groton, Vt

Rucker, Ronald, Director
Egbert Starr Library
Middlebury College
Middlebury, Vt 05753

Ruiter, Violet E., Librarian
Groton Free Library
Groton, Vt 05046
VERMONT INFORMANTS

Russell, Kenneth, Selectman
Plainfield, Vt

Ryan, Ruth, Librarian
Milton Public Library
Milton, Vt 05468

Salen, Peter, Local Historian
RFD 1
Plainfield, Vt

*Senecal, Joan, Town Clerk's Office
Orange, Vt

Shanley, Evelyn, Librarian
Morristown Centennial Library
Morrisville, Vt 05661

Shaw, Brenda, Librarian
Delaporte Memorial Library
Underhill Center, Vt 05489

Sindall, Barbara J, Librarian
Varnum Memorial Library
Jeffersonville, Vt 05464

Smith, Bertha, Librarian
Wolcott Community Library
Wolcott School
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Somers, Irene
Barnet Public Library
Barnet, Vt 08821

Sotyon, Sr. Jeane M, Librarian
Carmelite Monastry Library
Beekly Hill
Barre, Vt

Sorrell, Jean, Librarian
Concord Public Library
Concord, Vt 05824

Streeter, Nellie M., Librarian
Alden Bach Memorial Library
Lunenburg, Vt 05906

*Streeter, Nellie, Town Clerk's Office
Lunenburg, Vt

*Sumners, Irene, Librarian
Barnet Public Library
Barnet, Vt 05821

Sweeney, Hester, Librarian
Burnham Memorial Library
Colchester, Vt 05446

Talbert, Peggy, Librarian
Pierson Library
Shelburne, Vt 05482

Tasker, Virginia, Acting Librarian
Huntington Public Library
Huntington, Vt 05462

Tatro, Hildred, Librarian
Enosburg Public Library
Enosburg Falls, Vt 05450

Thibault, Bernice, Librarian
Highgate Public Library
Highgate, Vt 05049

Titus, Isabel, Librarian
Fairlee Public Library
Fairlee, Vt 05045

* Town Clerk
Groton, Vt

Townsend, Harold Local Historian
Plainfield, Vt

Turner, Ann, Director
Henry Prescott Chaplin Memorial Library
Norwich University
Northfield, Vt 05663

Walder, Brooks, Director
Walker Museum Library
Route 5
Fairlee, Vt 05045
VERMONT INFORMANTS

Walton, Dick Director
William Shipman Library
Eliot Pratt Center
Goddard College
Plainfield, Vt 05667

Warder, Robert, Local Historian
RFD
Barnet, Vt

Watson, Dick, Director
William Shipman Library
Goddard College
Plainfield, Vt

Weed, Kathleen, C., Librarian
Sutton Free Library
Sutton, Vt 05867

Wells, Leah, Librarian
West Burke Library
West Burke, Vt 05871

White, Redge, Town Clerk
Ryegate Corners, Vt

Wilkins, Blanche, President
Fairfax Historical Society
Box 105
Fairfax, Vt 05454

Williams, Edward M, Director
Rowland E. Robinson Memorial Association
Route 7
Rokeby, Vt 05456

Wills, Fred, Local Historian
Barnet, Vt

Wilson, Ruth B., Librarian
South Burlington Community Library
550 Dorset Street
South Burlington, Vt 05401

Woodward, Marion L, Librarian
Glover Public Library
Glover, Vt 05839

Wyllie, Elizabeth T, Director
Cobleigh Public Library
Depot St, Box 147
Lyndonville, Vt 05851

Young, Barbara, Librarian
Riley Wright Library
Coventry, Vt 05825
CANADA INFORMANTS

*Day, Gordon, Ethnologist
National Museum of Man
Ottawa, Canada

*Marois, Roger, Quebec Archaeologist
National Museum of Man
Ottawa, Canada
Mitigation of Cultural Resource Impacts *

Historic Impacts -

1. Physical alteration of historic sites is normally avoided through route selection procedures. Those sites identified through your studies will be taken into consideration in selection of transmission line rights-of-way. Additionally, an intensive survey will be conducted along the proposed transmission line routes to identify any sites which may have been overlooked. Through the above efforts those historic resources potentially in the path of the transmission line will be/selected to avoid them.

2. In some instances a transmission line right-of-way must cross broad areas designated as being important due/past activities or events which occurred there. Examples of such areas are a battlefield or a historic trail. In such instances the primary impact of the transmission line is one of visual intrusion upon the historic setting. Those special mitigative measures previously described for reducing visual impact upon a scenic or recreation area may have mitigative effects to given historic settings. (pages 9 & 10)

3. The physical remains of known historic features within the right-of-way are protected from damage by construction activities through the construction of barriers such as fencing around the remains and appropriate instructions are included within the construction contract to assure their protection.

* From Mitigation Measures, United States Department of Interior, 1977
4. Laws pertaining to the preservation and protection of cultural resources are strictly followed.

Archeologic Impacts -

1. As indicated in the discussion on historic impacts, the primary form of mitigation with respect to archeologic is to identify the location of such sites, sites/and through care in line location and tower placement avoid them. In this regard the DOI intends to conduct an intensive archeological survey of the proposed rights-of-way should the project be approved for construction. Professional archeologists will conduct investigations of tower sites, access road locations and other such areas of potential disturbance to assure that cultural resources will not be disturbed. Facilities found to be located upon an archeological site will be relocated or other approved mitigative actions initiated.

2. If in the course of construction an archeological site is discovered the contractor or construction inspectors are required to report the site and suspend activities in the area until the site can be investigated by an archeologist. Artifacts which have been disturbed are to be retained by the construction inspector for the archeologist. Objects still in place are to be protected from vandalism and are not to be moved.
3. Laws pertaining to the preservation and protection of cultural resources are strictly adhered to.

Socio-Economic Impact Mitigation Measures -

1. A significant socio-economic impact occurs where residences or other property improvements are displaced by the transmission line right-of-way. Such occurrences are normally infrequent as planning and location activities are designed to avoid this.

2. The proposed transmission facilities will be designed to meet or exceed the requirements of the National Electric Safety Code, which establishes safety criteria for electrical facilities. Transmission facilities are marked for air traffic safety in accordance with Federal Aviation Administration Standards where required.

3. The public is informed of the hazards associated with such activities as flying kites, model airplanes or climbing the towers by means of brochures, news releases and notices.

4. During the construction period residents in proximity to right-of-way may be impacted by the noise and dust, and air pollution which is created by construction machinery.
Also, in those areas where unmerchantable timber and slash is disposed of by open burning, some increase in the level of air pollutants may be experienced by nearby residents. Mitigative actions designed to minimize the effects of these pollutants are:

a. Noise generated by construction equipment may be reduced by: (1) modification of equipment by use of mufflers or baffles to reduce the actual noise of the equipment; (2) replacement of individual operations and techniques with less noisy ones, for example prefabrication of the structures instead of on site assembly; (3) selecting the least noisy equipment types; (4) scheduling of equipment operations to keep average levels low and to have noisiest operations coincide with times of highest ambient levels; (5) operate equipment as far as possible from site boundaries; (6) provide enclosures or barriers around particularly noisy construction areas; (7) noise regulations established under the Occupational Health and Safety Act are complied with.

b. Dust can be controlled by such actions as: (1) limitations may be imposed on the procedures for construction of the line such as restricting the types of machinery that may be used, limiting the speeds at which machinery may be operated. Areas and locations in which machinery is to be operated may also be limited; (2) water, straw,
gravel or dust oil may be used to reduce the generation of dust at work areas.

c. The impact of air pollution during construction operations can be mitigated by: (1) controlling the dispersal of pollutants by considering weather conditions and source location; (2) controlling pollutant production by modifying the pollutant source or by controlling the contractors operating methods. For example, alternate methods of burning such as tubs, pits and air curtain combustors may be required to reduce the extent of emissions, or other methods such as chipping or disposal at a sanitary land fill may be required; (3) vehicle exhaust emissions are controlled by applicable Federal, State and local laws. Contractors are required to maintain engines and equipment in proper adjustment to avoid excessive emissions; (4) contractors are not allowed to burn tires, plastics or other similar debris.

5. The health and safety of construction workers and visitors to construction areas are protected through compliance with the provisions of the Occupational Safety and Health Act.

6. Although the following impacts have not posed problems at 345 kV and below, small irregularities in the surfact of the electrical conductors can result in the generation of what is referred to as corona during operation of the transmission line. One form that corona takes is noise both audible and electro-
magnetic. Audible noise is most noticeable and greatest in magnitude during periods of light rain.

Transmission design alternatives have been found to be effective in reducing the level of audible noise. Design research and testing efforts are ongoing to further identify measures to mitigate this impact, especially at the higher voltages.

All radio, television reception and wire communication circuits can be susceptible to electromagnetic noise. Corona manifests itself as buzzing sounds on a radio and the dotted lines or snow effect on a television set, and background noise on communication circuits. Electromagnetic noise impacts can be minimized through the design of the transmission line and through selecting locations which are removed from communication facilities by 1/4-1/2 miles. Research and design activities are ongoing which are attempting to identify methods for further reducing electromagnetic noise impacts. Where interference is acute cable radio or TV may be installed to mitigate impacts upon individual residents.

Corona conditions also generate ozone and nitrous gases. Tests on high voltage transmission lines of 345-kV have indicated that there is not a sufficient amount of ozone or nitrous gas generated to be unhealthy to either humans or vegetation.

High voltage transmission lines can induce voltage in metallic fences, structures and equipment near the line. Procedures for grounding metal structures and equipment substantially eliminate the possible hazard and nuisance of these induced voltages and currents.
7. Visual impacts to a socio-economic sector resulting from the intrusion of the transmission line upon the scenic or esthetic characteristics of an area, may be to some extent mitigated through incorporation of the mitigation measures previously described for reduction of visual impact upon scenic or recreational areas (pages 9 & 10).

III. Mitigation Measures - Substation & Microwave Installations

Planning and Design - These facilities are different than the transmission lines in that they are site developments which fully utilize a site. Property for such installations is purchased in fee from the existing landowner. Given the full utilization of a substation site, planning and design activities offer the greatest opportunity for mitigation of impact. The following measures may be utilized to reduce the extent of impact that is created:

1) Existing substation or microwave installations will be utilized or expanded where possible which results in less total disturbed area.

2) Where new substations are to be developed, the site will be located in areas of least total impact. In this respect your studies will be utilized to adjust site boundaries to minimize impact.

3) These facilities will be designed to be as compact as is reasonably possible and thereby reduce the amount of land disturbed. Secondly, they will be designed to be as compatible as possible with the site surroundings.
Criteria pertaining to both of these design objectives are contained in the publication "Environmental Criteria for Electric Transmission Systems", USDI and USDA (being sent under separate cover).

Construction Methods -
Those sections on construction procedures which help to reduce the impact of transmission lines, are generally the same techniques utilized to reduce impact at substation and microwave installations. I have not therefore repeated them.

KAB/vlf
July 1977
GUIDELINES FOR THE LOCATION AND IDENTIFICATION OF HISTORIC PROPERTIES CONTAINING SCIENTIFIC, PREHISTORIC, HISTORICAL, OR ARCHEOLOGICAL DATA *

In order to notify the Secretary of the potential loss or destruction of significant scientific, prehistoric, historical, or archeological data pursuant to sections 2 and 3(a) of the Act, in a manner that will permit the Secretary to act effectively in response to this notification, it is necessary that the agency provide appropriate documentation concerning the nature and significance of all historic properties, subject to impact, that may contain such data. It is recommended that such documentation be generated by agencies in the course of their planning activities carried out under the authorities of the National Environmental Policy Act of 1969 (Public Law 91-190) (NEPA), the National Historic Preservation Act of 1966 (Public Law 89-665 as amended) (NHPA), Executive Order 11593, and related authorities.

It is important that agencies understand the relationship among NEPA, such general historic preservation authorities as the NHPA, and the Archeological and Historic Preservation Act. NEPA mandates the evaluation of project impacts on the entire environment, including all kinds of cultural resources. One kind of cultural resource is the historic property, which is the concern of the NHPA and Executive Order 11593. Section 106 of the NHPA sets forth specific actions to be taken when this kind of cultural resource is subject to effect. Some historic properties contain scientific, prehistoric, historical, and archeological data; the Archeological and Historic Preservation Act of 1974 provides

* From Request for Proposal No. 7009: Dickey-Lincoln Environmental Impact Studies, Units 2 and 3. United States Department of Interior, National
mechanisms for the recovery of such data if and when the planning processes provided for by NEPA, NHPA, and related authorities have resulted in the conclusion that data recovery constitutes the most prudent and feasible method of impact-mitigation.

Identification of cultural resources is an obvious prerequisite to the evaluation of impacts on such resources, and to the planning of methods for the mitigation of such impacts. Identification of cultural resources in general through the NEPA process involves a broad, general, interdisciplinary study of all those social and cultural aspects of the environment, both tangible and intangible, that may be affected by the undertaking. Identification of historic properties requires the location of those tangible places and things that may contain or represent historic values, and sufficient study of these properties to determine what their values are and whether these values are of sufficient importance to make the properties eligible for the National Register of Historic Places. In the process of such study, it should become apparent which properties contain significant scientific, prehistoric, historic, or archeological data. Once the undertaking's impacts on such properties have been evaluated, it will then be possible to ascertain whether data recovery constitutes an appropriate mitigation action, and it is at this point that the Archeological and Historic Preservation Act can be effectively utilized.

The guidelines presented in this appendix are the same as those required to identify properties eligible for the National Register of Historic Places pursuant to Section 106 of NHPA as amended and to sections 2(a),
2(b), and (where applicable) 1(3) of Executive Order 11593. Although prepared for publication under these authorities, they are presented here for the convenience of Federal agencies and other users.

I. General Conduct of Location and Identification Studies

Although the exact activities necessary for the identification of historic properties will vary depending on the nature of agency landholdings or jurisdiction and, where applicable, on the nature of the agency's undertaking, the following steps will generally be appropriate.

1. Background Research and Evaluation of Existing Data

   a. Since few areas of the Nation have yet been adequately surveyed for historic properties, current lists of such properties seldom provide adequate information for full identification. Documentary research is the starting place for any identification study, however. Systematic study and evaluation of documentary data will usually permit predictions to be made about the kinds of historic properties that may be encountered in the area, and about their possible distributions. Such study may also make it possible to develop a broad evaluatory framework within which the significance of particular properties can be judged. Finally, background research may pinpoint some particular properties that are already adequately documented, or properties that are known but need further study to obtain full documentation. In undertaking background research, answers to the following questions should be sought:

       (1) Are there known historic properties in the area?

       (2) Is knowledge about the presence or absence of historic properties based on a survey or surveys carried out according to the standards set forth in this chapter?
(3) If not, to what extent are survey data lacking?

(4) If the area has not been systematically surveyed, what predictions can be made about the location or kinds of historic properties to be expected based on data from nearby surveyed areas, from the known history of the area, from the constraints known to be imposed by the natural environment, etc.?

(5) Given the known history and prehistory of the region, the social and cultural concerns of its people, and pertinent State, local, and regional plans, what kinds of preservation and/or research priorities appear to be appropriate, and what kinds of historic properties might be important to the satisfaction of these priorities?

b. The agency undertaking a location and identification study, should be vigorous in searching out useful sources of data, and should encourage innovative approaches in their use to predict the locations of properties and to develop evaluatory frameworks. It must be recognized, however, that some institutions and organizations that maintain lists, files, or other bodies of unpublished data are legitimately concerned about the integrity of these documents and/or about the cost involved in permitting their use; these concerns should be ascertained and, if legitimate, honored. At least the following sources of background data should be consulted:

(1) The State Historic Preservation Officer should be consulted with reference to the State Historic Preservation Plan maintained by his office, to obtain such data as:

(a) information on properties listed in or nominated to the National Register, properties on other lists, inventories, or
registers known to the State Historic Preservation Officer, and properties on which the State has evaluated and unevaluated survey data;

(b) information on predictive data regarding potential properties in the area;

(c) recommendations as to the need for surveys in the area;

(d) recommendations concerning methods that should be used in conducting such surveys and possible sources of professional expertise;

(e) results of any previous surveys in the area, and the State Historic Preservation Officer's comments thereon; and

(f) recommendations concerning pertinent State or local laws and policies concerning historic properties.

(2) Basic published and unpublished sources on local history, prehistory, anthropology, ethnohistory, and ecology should be studied to obtain an overview of the region's potential historic property distributions and research or preservation values.

(3) The National Register and other lists or files of data on historic properties should be consulted. The National Register is published in its entirety in the "Federal Register," usually in February of each year; additions are published regularly in the "Federal Register." The most recent full publication and subsequent additions should be consulted to determine whether any properties exist in an area to be affected by a Federal undertaking. The National Register listings are also accompanied by a list of properties in both Federal and nonfederal ownership which have been determined to be eligible for
inclusion as well as a list of pending nominations. The catalogs of the Historic American Buildings Survey and the Historic American Engineering Record maintained by the National Park Service, and any similar surveys and published reports should be utilized. State, university, or professional society historians, architects, architectural historians, and archeologists, and local organizations may also have registers, inventories, catalogs, or other lists of sites or areas with known or presumed historic values.

(4) Persons with first-hand knowledge of historic properties and/or their historic values should be interviewed where feasible and appropriate. Such interviews, and a proper respect for the opinions expressed by those interviewed, are of particular importance where properties of cultural importance to local communities or social groups may be involved. Oral data should be elicited and recorded using existing professional methods such as those prescribed by the Oral History Association, Box 13734, N. T. Station, Denton, Texas 76203.

c. Background research should be undertaken by or under the supervision of professional historians, architectural historians, historical architects, and/or archeologists. It will often be necessary to draw upon the services of specialists such as ethnohistorians, anthropologists, sociologists, and cultural geographers to make full use of documentary data.

2. Field Inspection. If review and evaluation of existing information fails to produce complete data based upon prior professional examination of the area subject to environmental impact, then the background research should be supplemented by direct examination of the area of concern.
a. Staff and Planning. Field inspection usually can be performed only by professional historians, archeologists, architectural historians, and historical architects. It will sometimes be necessary or useful to call upon additional specialists to deal with particular characteristics of the area. For example, if industrial properties are present the services of an industrial historian or an industrial archeologist may be appropriate, and if the continuing ways of life of local social or ethnic groups are important to an understanding of the area's historic properties, social and cultural anthropologists and folklorists may be necessary additions to the staff. The exact nature of the appropriate staff will depend on the kinds of resources that can be reasonably expected to occur. For example, it is obviously unreasonable to employ an architectural historian or historical architect if the area of concern contains no standing or ruined buildings or structures.

The nature of the area will also affect the kinds of methods that must be employed to identify and record historic properties. Urban areas and rural areas require different approaches. Terrain, vegetation, land ownership and other factors will also affect the time required to conduct an inspection and the kinds of techniques that will be required to complete it. For example, if few indications of archeological sites are likely to appear on the surface of the ground because of vegetation, alluviation, or other factors, it will probably be necessary for archeologists to undertake subsurface testing both to locate sites and to obtain sufficient information for evaluation purposes.
Agencies planning field inspection should take factors such as the above into account in preparing work plans, and should consult with the Secretary, the State Historic Preservation Officer, and/or other qualified persons or groups to determine exactly what special approaches may be necessary.

Adequate records must be kept of all field inspections to clearly indicate what lands were inspected, the degree of intensity with which they were inspected, the kinds of historic properties sought, all historic properties recorded, and any factors that may have affected the quality of the observations.

b. Levels of field inspections: The intensity of field inspection in advance of an undertaking should be commensurate with the projected impact of the undertaking.

An undertaking whose effects will be indirect and diffuse—for instance an undertaking that will permit generalized population growth in a large area—will generally require a systematic sample reconnaissance, or some other less intensive field inspection than will an undertaking having definable direct impacts.

The level of project planning will also affect the nature of field inspection undertaken; at an early level of planning, when many options are open for location of project facilities, low-intensity reconnaissance may be appropriate to provide planning guidance; when alternative project locations have been reduced, a much more intensive survey will usually be necessary.
Although many different types of field inspections may be appropriate in different situations, such inspections generally fall into two types: reconnaissance survey and intensive survey.

3. **Reconnaissance Survey** - Full identification of historic properties for purposes of determination of eligibility and detailed planning normally requires that an intensive survey be conducted as discussed at section 1.2(b) of this appendix. Some agencies however, may find it helpful to their planning activities to conduct reconnaissance surveys in order to obtain preliminary or predictive data on the distribution and nature of historic properties. Reconnaissance survey is designed to provide a general impression of an area's historic properties and their values, and involves small-scale field work relative to the overall size of the area being studied. Although reconnaissance survey will seldom if ever provide sufficient data to insure identification of all historic properties in an area, it should make it possible to identify obvious or well-known properties, to check the existence and condition of properties tentatively identified or predicted from background research, to identify areas where historic properties are obviously lacking, and to indicate where certain kinds of properties are likely to occur, thus making possible a more informed and efficient intensive survey at a later stage in planning.

In areas of potential direct impact from Federal undertakings, reconnaissance survey should be used only as a preliminary to an intensive survey, unless the reconnaissance reveals that it is impossible or extremely unlikely for historic properties to occur in the area. In
areas of potential indirect impact, reconnaissance may provide sufficient
data to permit an agency to evaluate its possible impacts and to develop
plans to assist local agencies in avoiding or mitigating such impacts.
In cases where a Federal agency intends to license or permit a State,
local, or private undertaking, particularly if the undertaking involves
large land areas, a reconnaissance may provide the agency with sufficient
information to permit the development of protective stipulations in the
permit or license. An agency that participates in many small-scale
undertakings in a large region may find it useful to undertake a
reconnaissance of the region in order to develop a basis for making
decisions about the need for intensive surveys on individual projects,
or to obtain guidance in the kinds of survey activities that may be
needed. Although a reconnaissance survey will not ordinarily provide
sufficient data to insure identification of all historic properties
under the jurisdiction or control of, or subject to impact by a
Federal agency, it may be a very useful tool for effective agency
planning. A reconnaissance survey is preceded by adequate background
research as discussed above. In the field an effort is made to gain
a sufficient impression of the area under consideration, and its
cultural resources, at least to permit predictions to be made about
the distribution of historic properties within the area and the
potential significance of such properties. For small areas, a super-
ficial visit to the area by professionals in pertinent disciplines
(architectural historians, historians, archeologists, and others whose
expertise is appropriate to the study of the area) may be sufficient
for reconnaissance purposes. Such a reconnaissance should provide an
informed general opinion about the kinds of properties that might be encountered and the appropriate methods to be used in completing an intensive survey if such a survey is necessary. For larger areas, a more systematic approach to reconnaissance survey is usually necessary. For archeological resources this usually involves the detailed inspection of selected lands representing a statistically valid sample of the entire area, from which projections can be made to the entire area. Comprehensive drive-through or walking inspections of architecturally significant resources, or at least spot-checks of various neighborhoods within the area, are appropriate for the characterization of architectural resources in such a reconnaissance. Coordination in the field with local parties interested in or knowledgeable about the area's history and historic properties is appropriate during a reconnaissance as during an intensive survey.

4. Intensive Survey - An intensive survey is a systematic, detailed, field inspection done by or under the supervision of professional architectural historians, historians, archeologists, and/or other appropriate specialists. This type of study is usually required to determine the significance of properties and their eligibility for listing in the National Register. It is preceded by adequate background research as discussed above. All districts, sites, buildings, structures, and objects of possible historical or architectural value are examined by or under the supervision of a professional historian, architectural historian, or historical architect. Persons knowledgeable in the history, prehistory, and folkways of the area are interviewed by or under the supervision of a professional historian, ethnohistorian,
cultural anthropologist, or folklorist. The surface of the land and all districts, sites, buildings, structures, and objects of possible archeological value are inspected by or under the supervision of a professional archeologist. Historic archeologists are employed where historic sites are likely, prehistoric archeologists are used if prehistoric sites are probable. Systematic subsurface testing is conducted if necessary to locate or obtain full descriptive and evaluative data. Documentary data necessary to the evaluation of specific properties are complied and analyzed. A systematic effort is made to identify all properties within the area of concern that might qualify for the National Register, and to record sufficient information to permit their evaluation. All historic properties should be evaluated against the criteria established at 36 CFR 60.6, and supporting documentation should be developed with reference to the standards published in the "Federal Register" for comment on April 27, 1976, as 36 CFR 63, Appendix A. Since the precise kinds of field activities necessary to fully identify historic properties vary among the different regions of the United States, it is vital that agencies preparing to undertake intensive surveys consult with the State Historic Preservation Officer and other sources of professional guidance in developing plans for such surveys.

II. Special Considerations with respect to Submerged Lands

For submerged lands documentary research by qualified researchers may serve to indicate the need for, and recommended location of, physical and/or electronic surveys for submerged archeological sites and sunken vessels. Because of the specialized nature and problems attending
underwater survey activities, agency officials may wish to determine specific survey procedures in consultation with the Director, Office of Archeology and Historic Preservation, National Park Service, Washington, D.C. 20240.

III. Documenting Location and Identification Studies

The nature and level of specificity required in documenting a location and identification study will vary somewhat with the scope and kind of undertaking (if any) for which the study is conducted, the kinds of information already on hand about the area being studied, and other factors. In general, however, it is necessary to document the methods used in conducting the study, the assumptions that guided the application of the methods, the results of applying the methods, and any deficiencies in these results that may have arisen from the application or mis-application of the methods. Typically, the report of a location and identification study should contain the following types of information.

1. **Description of the study area.** Boundaries of the area should be indicated and the rationale used in defining the boundaries should be presented. Topographic and environmental characteristics that might affect the distribution, significance, or preservation of historic properties should be described.

2. **Background research and preparation.** Documentary data and, where relevant, data from oral sources pertinent to the study should be discussed and evaluated. Sources utilized should be identified, and methods of analysis presented and discussed. Background data should be analyzed in such a way as to form a basis for planning any necessary
field investigations, and for evaluating the significance of properties that may be discovered. Accordingly, the researcher should indicate a familiarity not only with local history and prehistory, but also with the professional literature in history, architecture, anthropology, archeology, or other disciplines that may provide bases for evaluating historic properties.

3. Research Design. The report should also set forth the research design or plan of study that guided the work, discussing what sorts of historic properties were expected in the area, what historic values they might represent, and what strategies were to be employed in seeking the resources. Often it will be possible to make specific predictions about what kinds of properties can be expected in the field and how they ought to appear. The researcher should also set forth any biases or sources of error that can be identified as having potentially influenced the results of the study. For example, researchers trained specifically in prehistoric archeology may be unable to accurately observe historic properties; if this bias is not corrected by adding an historian, historic archeologist, or architectural historian to the study team, it should be explicitly acknowledged in the report as a possible source of error.

4. Field Inspection. The composition of the field study team should be presented. An attempt should be made to insure that all pertinent professional disciplines are represented in this team. Names and qualifications of team members and consultants should be presented and their duties discussed. It is the researcher's obligation to employ persons and methods that will insure the accurate recognition of all
classes of historic properties. Methods used in seeking, observing, and recording historic properties should be clearly set forth. The extent to which the study area was fully covered by inspectors on foot should be presented, textually and/or using maps and charts. Any portions of the area not inspected, or inspected at a lower level of intensity, should be indicated and discussed. On-the-ground observational procedures should be presented.

a. In reporting the inspection of lands thought to contain non-structural historic properties, or structures in ruins, the following should normally be discussed:

(1) how surveyors were distributed over the study area, how far apart they were placed and in what directions they walked;

(2) what signs of historic and/or prehistoric activity surveyors were instructed to seek;

(3) what special techniques, if any, were used to seek special kinds of properties thought to occur in the area (e.g., rock art, standing structures), and/or to cope with special environmental difficulties (e.g., pavement, heavy brush, overburden);

(4) if subsurface testing was done, under what conditions it was done, what techniques were used, and where it was done; and

(5) if less than the entire area was inspected, a sampling design should be presented and justified.

b. In reporting the inspection of lands containing buildings, and/or structures, the following should normally be discussed:

(1) how surveyors covered the area--by foot, auto, etc.;
(2) whether surveyors proceeded individually or as teams;
(3) intensity of inspection of properties; did the inspection address only facades? exteriors? interiors?
(4) how much of the area was covered at a time; did the inspection cover the entire area, proceed in stages, or cover only a portion? The rationale for the coverage strategy should be presented; and
(5) what kinds of properties were surveyors instructed to seek (e.g., industrial as well as domestic buildings; vernacular architecture as well as "high style" buildings; buildings representing different "themes")?

c. The above categories are not presented as a "check list," but as examples of the kinds of questions that should be answerable using the report of a field inspection. To the extent possible, archeological and architectural/historical inspections should be coordinated, since many properties discovered may be of both archeological and historic architectural importance.

d. All procedures used should be justified in terms of their applicability to the area, its potential properties, its environment, and the plan of study.

5. Results.

a. If an intensive survey has been done, all historic properties should be clearly and completely described. To the extent possible, documentation of properties should refer to Appendix A to the "Procedures for Requesting Determination of Eligibility," 36 CFR Part 63, published for comment in the "Federal Register," April 27, 1976.
Documentation can be provided on standard forms or as text, but should be complete and internally consistent.

b. If a reconnaissance survey has been done, the predicted distributions of historic properties should be presented and justified on the basis of background research and field inspection. Specific historic properties actually recorded during the field inspection should be described, insofar as possible, as set forth at Section III(5)(a) above.

c. Negative data, as well as positive data should be presented and discussed, i.e., if historic properties were not found, this fact should be noted and, if possible, accounted for.


a. Evaluations of historic properties should be made in sufficient detail to provide an understanding of the historical values that they represent, so that this understanding can serve as a basis for managing the properties or planning impact-mitigation programs if necessary. Properties valuable for their data content should be evaluated in such a way as to facilitate the development of research designs for data recovery programs if such programs become necessary. Properties of importance to a community, neighborhood, social or ethnic group should be discussed with reference to the values and concerns of those to whom the properties may be important.

b. If an intensive survey has been done, all historic properties should be evaluated against the criteria of eligibility for the National Register of Historic Places set forth at 36 CFR 60.6.
c. If a reconnaissance survey has been done, to the extent possible, the predicted significance of each kind of historic property likely to occur within the study area should be presented and justified in relation to its general cultural setting, with reference to the criteria set forth at 36 CFR 60.6.

7. Recommendations. In most cases it is expected that the report will provide recommendations concerning any need that may exist for further study, evaluation, or, where applicable, impact mitigation.

8. Accompanying photographs, graphics, and tabular material. A location and identification study report should contain sufficient photographs, maps, charts, tables, and appendix material to insure its accurate use for study and planning purposes.