

PINELANDS CULTURAL RESOURCE MANAGEMENT PLAN

for Historic Period Sites



Revised

April 1991

NEW JERSEY PINELANDS COMMISSION

The Pinelands Cultural Resource Management Plan for Historic Period Sites provides supplemental guidance and further explanation of the standards relating to "Part XV-Historic, Archaeological and Cultural Preservation" of the Pinelands Comprehensive Management Plan. This cultural resource plan has been developed pursuant to the provisions of N.J.A.C. 7:50-6.151 et seq.

The "March, 1986" plan was adopted by the Pinelands Commission via Resolution #86-26 on March 7, 1986.

The "Revised August, 1990" plan was adopted by the Commission via Resolution #PC4-90-121 on August 10, 1990.

* * * * *

This document was prepared with the assistance of a Historic Preservation Fund Grant from the U.S. Department of the Interior, National Park Service. Grant funds are administered by the Office of New Jersey Heritage, N.J. Department of Environmental Protection.

For further information, contact the New Jersey Pinelands Commission, P.O. Box 7, New Lisbon, NJ 08064

FOREWORD

This cultural resource management plan*revises and replaces a previous plan which was adopted by the Pinelands Commission in 1986. It is intended primarily for use by municipal planning boards, boards of adjustment and historic preservation commissions in implementing the historic preservation provisions of the New Jersey Pinelands Comprehensive Management Plan, N.J.A.C. 7:50-6.151 et seq. The Pinelands plan further states that municipalities whose master plans and land use ordinances are certified by the Commission are authorized to grant development approvals within their jurisdiction (N.J.A.C. 7:50-3.38). By virtue of these provisions, certified municipalities are charged with the primary responsibility for reviewing development applications for their impact on significant historic and prehistoric resources. This preservation plan provides a step-by-step guide which municipal agencies may use for the identification, evaluation and treatment of such resources when they occur in areas proposed for development. The plan has been written specifically for use by individuals with little or no prior experience in the preservation of cultural resources.

Chapter I explains the provisions related to Pinelands and Local Designation, the Commission's program for registering sites of historic significance and protecting them from inappropriate alterations. Chapter III details the process by which cultural resource surveys are undertaken to determine whether or not an historic or prehistoric site of consequence is present. If such a site is found, Chapter IV describes the recommended treatment procedures for various types of sites based on the nature of the historic activity that took place there and on the site's state of preservation.

With the aid of this plan, Pinelands municipalities should be able to render decisions at the local level as to the type of treatment that will be accorded to historic sites. However, the Pinelands Commission remains ready to provide any assistance and technical advice which municipal officials may desire in reaching these decisions.

The cultural resources of the Pinelands are the silent testimony of the countless thousands of Americans who occupied this land before us. They are a part of our national heritage. Careful consideration and planning for them at the local and regional level will insure that their potential for providing information about our nation's past will be fully realized.

Glasshouses	76
General Description	76
Historical Summary	77
Elements of a Glasshouse Site and the Glassmaking Process	78
Present Status	81
Research Priorities	82
Significant Persons Associated with Pinelands Glasshouses	90
Significant Events Associated with Pinelands Glasshouses.	91
Special Evaluation and Recording Requirements	92
Iron Forges and Furnaces	97
General Description	97
Historical Summary.	98
Elements of a Forge/Furnace Site and the Iron Smelting Process	100
Present Status	103
Research Priorities	104
Significant Persons Associated with Pinelands Forges and Furnaces	112
Significant Events Associated with Pinelands Forges and Furnaces	113
Special Evaluation and Recording Requirements	114
Maritime Activities.	119
General Description	119
Historical Summary.	120
Elements of a Maritime Site and Present Status.	124
Research Priorities	126
Significant Persons Associated with Pinelands Maritime Activities	136
Significant Events Associated with Pinelands Maritime Activities	137
Special Evaluation and Recording Requirements	138
Minor Industries	143
General Description	143
Historical Summary	143
Present Status	146
Research Priorities	146
Significant Persons Associated with Pinelands Minor industries	151
Significant Events Associated with Pinelands Minor Industries	152
Special Evaluation and Recording Requirements	153
Sawmills.	158
General Description	158
Historical Summary	159
Elements of a Sawmill Site and the Milling Process.	162
Present Status	164
Research Priorities	166
Significant Persons Associated with Pinelands Sawmills.	170
Significant Events Associated with Pinelands Sawmills	171
Special Evaluation and Recording Requirements	172

TABLE OF CONTENTS

Foreword	i
Table of Contents	ii
Acknowledgements	v
How To Use This Document	vi
Introduction	1
The Preservation Planning Process	2
Pinelands Resource Groups	4
Recommendations for Treatment	6
Future Planning	9
Summary of Pinelands History from the 17th to the 20th Centuries . .	11
 <u>Part A: Designating and Protecting Landmarks and Historic Districts</u>	
Chapter I: Designation of Significant Cultural Resources of the Pinelands	18
Process of Designation	18
Surveys to Determine Eligible Properties	21
Chapter II: Certificates of Appropriateness	23
Certificate Required for All Significant Sites.	23
Provisions Governing Issuance of a Certificate	23
Additional Protection Through Zoning Flexibility.	24
 <u>Part B: Identifying, Evaluating and Treating Undesignated Historic Sites</u>	
Chapter III: Measures for Identifying Historic Sites in the Development Review Process	26
Role of the Comprehensive Municipal Inventories	30
Chapter IV: Evaluation and Treatment of the Nine Pinelands Resource Groups	33
General Evaluative Criteria	33
General Treatment Requirements	34
Agricultural Sites and Gristmills	48
General Description.	48
Historical Summary	49
Elements of an Agricultural Site	53
Present Status	57
Research Priorities.	59
Significant Persons Associated with Pinelands Agriculture. .	69
Significant Events Associated with Pinelands Agriculture .	70
Special Evaluation and Recording Requirements	71

Settlements	177
General Description	177
Historical Summary	177
Settlement Types	180
Present Status	183
Research Priorities	183
Significant Persons Associated with Pinelands Settlements	186
Significant Events Associated with Pinelands Settlements	188
Special Evaluation and Recording Requirements	190
Transportation Routes and Railroads	194
General Description	194
Historical Summary	195
Elements of a Transportation Site	196
Present Status	198
Research Priorities	198
Significant Persons Associated with Pinelands Transportation Networks	203
Significant Events Associated with Pinelands Transportation Networks	204
Special Evaluation and Recording Requirements	205
Residential Architecture	210
Historical Summary	210
Traditional and Vernacular Houses of the Pinelands: A Preliminary Typology	213
Research Priorities	219
Significant Sites Associated with Pinelands Residential Architecture	223
Special Evaluation and Recording Requirements	224

Part C: Interpretation of Resources

Chapter V: Cultural Resources Management and Interpretation	228
---	-----

Appendices

Appendix A: Guidelines for Comprehensive Municipal Inventories	239
Appendix B: Guidelines for Cultural Resource Surveys	249

ACKNOWLEDGEMENTS

The Office of New Jersey Heritage, Department of Environmental Protection, has played a major role in the formation of this plan. ONJH provided a grant to the Pinelands Commission to aid in creating a staff cultural resource specialist position. Funding for this grant was derived from the United States Department of the Interior Historic Preservation Fund. ONJH further assisted the Commission by initiating a survey of sawmill sites in the Pinelands (also with moneys allocated from the Historic Preservation Fund) and by providing detailed comments on the format and substance of this plan.

The National Park Service., United States Department of the Interior, has contributed substantially to this plan, reviewing all of the chapters and submitting valuable commentaries. The chapter on interpretive planning was the result of an extended survey carried out by Park Service personnel at the request of the New Jersey Department of Environmental Protection.

Dr. David Glassberg was the author of the chapter on interpretive planning in the Pinelands. As a temporary NPS employee, Dr. Glassberg organized and executed the survey of historical organizations and supervised the interpretive study. The interpretive planning chapter of this plan, which was based on the more extended NPS report, was his personal contribution.

Mr. Budd Wilson, a professional archaeologist who resides in the Pinelands, made his personal collection of research materials available to Commission personnel. He regularly attended the Advisory Committee meetings and reviewed the text of this plan, making a number of suggestions for its improvement.

The Pinelands Cultural Resource Management Plan Advisory Committee is composed of representatives of federal, state, county and municipal government, technical preservation experts and private citizens' groups. The committee reviewed the original plan, which was adopted in 1986, and made numerous suggestions to improve its effectiveness. Committee members included:

Frank Banisch	Alan Mounier
Julie Gandy	Frank Murphy
Jonathan Gell	Donald Pettifer
Bob Griffith	Dick Regensburg
Jim Kellers	Pat Sheehan
Marilyn Kralik	Mary Ann Thompson
Dave Miller	Sid Walker
Pauline Miller	

HOW TO USE THIS DOCUMENT

Of the many ways that significant historic resources can be subdivided and categorized, perhaps the most rudimentary way is also the most useful for municipal officials and preservation planners. Simply put, the distinction is between resources that are known and those that are not known. In most municipalities there are local landmarks which, though they may not yet be protected in the zoning ordinance, are generally recognized as integral parts of the town's past which should be saved. Yet there are usually other sites - often, but not always, archaeological and therefore mostly invisible - which are of equal or greater significance, but are not widely known. These too deserve protection, but are in greater danger of destruction because their historic value is unacknowledged.

This cultural resource management plan recognizes that there are both identified and unidentified resources of significance in every Pinelands municipality. For those sites regarded as historic by local consensus, the plan describes the procedure for formal designation in the master plan and zoning ordinance. For other sites, those not previously known, the plan provides for their identification, evaluation and treatment principally through the completion of historic surveys required as part of a development application. Local officials in the Pinelands will address the issue of resource protection in one of these two ways, either through the process of designating landmarks and/or historic districts or through the review of development applications which potentially may affect significant historic or prehistoric sites. Designation procedures and the preservation of designated resources are addressed in Part A of this plan (Designating and Protecting Landmarks and Historic Districts) and development review in Part B (Evaluating and Treating Undesignated Historic Sites).

The formal designation of historic resources via local ordinance is discussed in Chapter I. Criteria for determining whether sites actually possess historic merit are presented in this chapter and the method by which these criteria should be applied to individual sites is explained. There is also a brief discussion as to how municipalities can undertake historic site surveys to identify resources eligible for designation.

Once a site or district has been designated, alterations to the resource(s) cannot be undertaken without issuance of a certificate of appropriateness. Chapter II summarizes the actions which require a certificate, the standards used to assess the impacts of the proposed project and the procedures for issuing the certificate.

The review of development applications for impacts on potentially significant historic resources is discussed in Chapters III and IV. Chapter III contains guidance for determining under what circumstances a cultural resource survey should be required (i.e., is there a possible historic resource present?). Included are general criteria which indicate when a survey is necessary and specific guidelines for

assessing the likelihood of archaeological site occurrence. The chapter also has a description of the Comprehensive Municipal Inventory program, which towns may undertake and then adopt in land use planning to rank areas according to the intensity of historic site occurrence. These rankings can then be used by permitting agencies to determine the need for a cultural resource survey at individual development sites. The inventory guidelines are found in Appendix A while the guidelines for the conduct of cultural resource surveys (pursuant to a development application) are in Appendix B.

Chapter IV is an extended study of each of the nine major "resource groups" (groupings of functionally related sites, such as glasshouses, iron forges and furnaces, maritime sites, etc.) represented in the Pinelands, with precise guidance for evaluating and protecting the individual sites within each group. Those sites which are determined to be historically significant require a certificate of appropriateness, the same as formally designated sites, before any alterations can occur to them (see Chapter II). For continued protection, formal designation must occur within a year.

Following is a list of some of the most commonly asked questions and concerns posed by property owners, municipal officials and consultants and responses to each. Further guidance on the use of this plan and on preservation matters generally is always available from the Pinelands Commission staff.

PROPERTY OWNERS:

Is my property designated?

A property can be designated by the municipality in which it is located (Local Designation) or by the Pinelands Commission (Pinelands Designation). Any site on the New Jersey or National Registers of Historic Places is also automatically Pinelands Designated.

- ° Request a Letter of Interpretation from the Commission as to whether any designated resources are located on your property.

Is my property eligible for designation?

To be eligible, a property must meet at least one of four criteria of historic significance and must retain most of its historical fabric and general appearance.

- ° See Chapter I for the criteria of eligibility.

How do I go about having my property designated?

Any individual may nominate any site in the Pinelands Area for designation by submission of a completed "National Register of Historic Places Registration Form". The form is available from the Commission or the Office of New Jersey Heritage (ONJH). The

nomination may be submitted to the municipal governing body or the Pinelands Commission for designation or to ONJH for entry on to the New Jersey Register of Historic Places. ONJH will forward any successful nomination to Washington for National Register consideration.

- ° See Chapter I for the designation process.

How does designation affect my ability to alter or develop my property?

Once a site has been designated, it cannot be altered without issuance of a certificate of appropriateness, in some cases from the municipality and in others from the Pinelands Commission. The certificate is meant to ensure that any changes to, or development of, a property are compatible with its historic significance. Normal repair and maintenance are exempt from the requirement for a certificate.

- ° See Chapter II for the basic provisions relating to issuance of certificates of appropriateness.
- ° See Chapter IV for the detailed treatment requirements.

If there is a possible historic site on my property which has not been designated, does this affect my ability to develop it?

A site which has been determined to be eligible for designation is subject to the same treatment requirements as a designated site (i.e., a certificate of appropriateness must be issued before any development can occur). A determination of eligibility is made via a cultural resource survey of the property, conducted by a qualified consultant as part of the information required for a development application.

- ° See Chapter I for the criteria of eligibility for designation and Chapter III for an explanation of the survey procedures and requirements.
- ° See Appendix B for the guidelines for an acceptable survey.

MUNICIPAL OFFICIALS:

How do I know what is already designated?

Sites may be designated by the local government or by the Pinelands Commission and are also considered designated by entry on to the New Jersey or National Registers of Historic Places.

- ° Contact the Pinelands Commission for a listing of designated sites in your municipality.

How does designation differ from the New Jersey and National Registers?

Designation uses criteria virtually identical to the Register programs to evaluate resources and thus the types of sites that are eligible are the same. However, the New Jersey and National Registers are mostly honorific and do not impose any restrictions on alterations or development of private property outside of the Pinelands Area, unless there is federal or state involvement in the project. As noted above, Register sites within the Pinelands Area are automatically designated.

- ° See Chapter IV for the specific protective measures required for designated sites.

How do I go about designating a site or district?

Sites are designated through completion of a "National Register of Historic Places Registration Form" (available from the Commission or ONJH) which must then be submitted to either the local governing body or the Pinelands Commission for formal designation or to ONJH for entry on to the State Register. Alternatively, sites may be designated through adoption of a historic district or historic landmarks ordinance by the municipal governing body. The ordinance must conform to the provisions of the Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.).

- ° See Chapter I for the designation process.
- ° Contact the Commission for a copy of the Pinelands Model Historic Preservation Ordinance.

How can I assist prospective development applicants in determining whether they have significant historic sites on their property?

The Pinelands Commission has developed a "Comprehensive Municipal Inventory" (CMI) program so that local officials and development applicants can tell at a glance where concentrations of historic sites occur and, consequently, where cultural resource surveys should be undertaken prior to development.

- ° See Chapter III for more information on the CMI and Appendix A for guidelines for compiling an inventory.

How do I know when a cultural resource survey should be required for a development application?

Because of the possibility of archaeological site occurrence which may leave little or no surface trace (especially prehistoric Native American sites), it is not always clear at the outset when a survey should be undertaken.

- ° See Chapter III for guidance on when to require a survey.

- ° Contact the Pinelands Commission for further assistance.

How can I evaluate sites for their historic significance?

This problem will arise most often either when you are considering a landmark or district for designation or when you are reviewing a development application which may affect a historic site. In many of these cases, particularly in the review of development applications, the services of a professional consultant will be necessary to research and evaluate a site properly.

- ° See Chapter I for the criteria of eligibility for designation.

If an eligible resource is found on a development site, how do I determine in general how development can proceed?

Resources that are eligible for designation must be preserved in place if at all possible in a manner compatible with their historic characteristics.

- ° See Chapter II for the general provisions relating to certificates of appropriateness and Chapter IV for the specific treatment requirements.

CONSULTANTS:

What qualifications must I have in order to conduct cultural resource surveys in the Pinelands Area?

Consultants must meet the same education and experience requirements as for state and federal projects. They are listed in the Code of Federal Regulations.

- ° See 36CFR61 or contact the Pinelands Commission or ONJH for an explanation.

Does the Pinelands Commission maintain a consultants' list which is available to development applicants?

Yes. Consultants who wish to be listed must establish their professional credentials to the Commission or to ONJH. The list is not necessarily complete nor does it imply certification or recommendation. Qualified consultants do not have to be listed to do surveys in the Pinelands.

- ° Contact the Commission for further information.

How do I conduct a cultural resource survey that will be acceptable to the Pinelands Commission?

In broad terms, the survey will consist of sufficient background documentation and field testing to determine the nature and extent of any designated or eligible resources on a development site.

- See Appendix B for the detailed survey guidelines.
- Contact the Commission for guidance on the conduct of specific surveys.

INTRODUCTION

Legislation designed to safeguard the historic and cultural heritage of this country is not a concept that originated with the Pinelands Protection Act. In fact, the legal basis for government intervention to protect the national patrimony goes back to the turn of the century - to the Antiquities Act of 1906. Throughout the entire 20th century, federal and state governments have been clearly delineating an ever broader mandate for retaining the physical remnant of America's past. Unlike other aspects of government intervention, which have waxed and waned with the changing political climate, the preservation movement has generally enjoyed broad based support among both politicians and the public.

This first legal foothold, the Antiquities Act of 1906, gave the president the right to declare historic sites on public lands to be "National Monuments" and provided penalties for tampering with such antiquities. The Historic Sites Act of 1935 was the next advance in the preservation cause. This act declared a national policy of preserving historic sites, buildings and objects, and gave the Secretary of the Interior the right to survey and acquire properties of historic significance. The National Trust for Historic Preservation was established by amendment to this act in 1949 and continues to this day as one of the major vehicles in the fields of research and historic sites acquisition and management. Further legislation in the 1960 provided for the protection of historically sensitive areas from encroachment by federally sponsored dam projects, road construction, and eventually any terrain alteration.

This all culminated in the National Historic Preservation Act (NHPA) of 1966, a far reaching and farsighted document that is at the legal heart of the preservation movement today. This law mandated the creation of State Historic Preservation Offices in each state to oversee local activities and allocated money to them for acquisition and development and for state-wide surveys to identify and map sites. Most significantly, the act decreed that any undertaking that has any sort of federal involvement whatever must be preceded by survey work to see if there are sites eligible for the National Register of Historic Places within the project area. Moreover, the definition of the National Register was expanded to include sites which are of local historical importance, not just national importance. Most states have since followed suit with similar legislation governing state projects.

More legislation followed in the 1970, including the Archaeological Resources Protection Act of 1979 which for the first time dictated criminal penalties for the plunder of archaeological sites on federal or Indian lands. Removal of artifacts from a site on public lands without a permit is now punishable by a fine of \$10,000 and imprisonment for one year.

On the state level, the New Jersey Register of Historic Places Act was enacted in 1970. Modeled after the National Historic Preservation Act, New Jersey established a State Register with identical criteria for

eligibility as the National Register. The State Register Act provides for regulatory review of state, county, and local projects which would encroach upon a State Register property. Any public undertaking which would affect a State Register property requires authorization from the Commissioner of the Department of Environmental Protection.

In New Jersey, the Commissioner of Environmental Protection is responsible for the State and National Register programs. The Commissioner serves as New Jersey's State Historic Preservation Officer (SHPO). The Office of New Jersey Heritage (ONJH), within the Division of Parks and Forestry, Department of Environmental Protection, serves as New Jersey's State Historic Preservation Office.

Municipal programs for historic preservation began in the 1920s and 1930s with local ordinances which provided for the designation and protection of historic districts in New Orleans, Charleston, and Savannah. Today, there are over 800 municipal historic preservation programs in the United States established by local ordinance. Typically, these focus on buildings of historic or architectural significance and require architectural review of public and private actions affecting those buildings that would be visible from a public-right-of-way.

New Jersey had over 45 local ordinances in 1985, when the Municipal Law Use Law was amended to establish specific enabling authority and guidelines for municipal historic preservation ordinances. Many New Jersey municipalities are currently in the process of bringing their local preservation ordinances into conformance with the amended Municipal Land Use Law. The law now requires that historic resources be identified in the municipal master plan and formally designated in the zoning ordinance. It allows a municipality to utilize the planning board to regulate historic resources or to create an historic preservation commission to regulate historic resources and operate a historic preservation program.

The Preservation Planning Process

In the Pinelands the major provisions for the protection of historic and cultural properties are contained in Subchapter 6, Part XV, of the Comprehensive Management Plan (N.J.A.C. 7:50-6.151 et seq.). These provisions allowed for the creation of historic preservation commissions in each municipality and clearly delineated their powers and duties; instituted a program of designation of significant historic sites; defined standards for the designation process and required a Certificate of Appropriateness before any alterations are made to a designated site; and called for cultural resource surveys to be undertaken at all major development sites so that previously undetected historic or prehistoric sites would not be adversely affected.

The major Commission responsibilities dealing with these provisions have been in the realm of development review. Applicants for major development (and for minor development in Pinelands Towns and Villages) generally request a determination as to the presence of historic and cultural resources on their project site. The Executive Director then

evaluates the site's potential to yield significant information and determines whether a waiver of the full survey requirement is warranted.

These procedures have proven themselves adequate to protect historically sensitive areas from the more imminent dangers of encroachment by pending development. However, they are essentially reactive in nature rather than anticipatory and do not provide for differential treatment of sites based on their assessed significance. The Commission realized from the outset the need for a more structured approach to the long-term preservation of historic sites. To that end, work was begun on a cultural resource management plan based on the Resource Protection Planning Process circulated by the U.S. Department of the Interior in 1979. The "RP3" model was designed to aid states in evaluating and managing the broad spectrum of historic and prehistoric sites within their jurisdictions. The purpose of RP3, and the ultimate purpose of all preservation planning, is to develop a format which "identifies and organizes information about a State's historic, archaeological, architectural and cultural resources into a form and process readily useable for producing high reliability decisions, recommendations and/or advice about identification, evaluation, and protection of these resources."

The major element of this process involves the use of the "study unit" concept for organizing material culture. Sites or resources which are functionally related are grouped together and evaluated as a unit for their impact on the evolution of culture. In this way, the preservation planner is able to analyze sites within their cultural context, rather than as discrete entities irrespective of the social and historical patterns around them. What determines a site's significance is the impact of the activity that took place there upon the contemporary society and the site's ability to yield useful information about that activity.

The Pinelands cultural resource management plan uses the study unit concept as the basis for organizing and appraising the more than 500 historic period sites listed in the Commission inventory. The historic period is defined as that for which a contemporary written record is available. In North America this begins only with the advent of European contact, ca. 1500 A.D. "Prehistory" refers to the entire period of aboriginal occupation, starting roughly about 10,000 B.C. and continuing for approximately 11,500 years. The analysis of remnant physical culture in this country has traditionally been organized according to these two major cultural components. The Pinelands plan will also address them separately and the approach toward each, given the vast differences in extant remains and existing information, will necessarily be different.

The prehistoric component, which is yet to be completed, has a very meager data base. Although more than a thousand sites have been inventoried, these must represent only a fraction of all the Amerindian activity that took place in the region in eleven millenia. The major problems in devising a management strategy for these prehistoric sites are primarily in locating them and in establishing the nature of each, i.e., categorizing the activities that occurred there. Such sites rarely leave more than a vestigial trace at the surface, if any at all,

and their existing inventory is not sufficient to determine how they functioned.

Historic period sites lend themselves far more readily to tightly defined study unit groupings, since their purpose and physical remnant is generally easier to detect. A good example of this in the Pinelands is the celebrated bog iron furnace and forge sites. The forge/ furnace itself and its ancillary structures, the buildings that grew in the settlement around the furnace (workers' housing, company store, owner's mansion, etc.) and the peripheral loci of activity directly related to the bog iron industry (collier's mounds, iron mining sites, shipping docks, etc.) constitute a single study unit.

Pinelands Resource Groups

As part of the initial assessment of cultural resources prepared in advance of the Comprehensive Management Plan, a series of study units was defined for the Commission in 1980. With some slight alteration these have formed the basis for the "resource groups" (the term used in place of "study units") in the present plan. The list is not necessarily exhaustive and as the plan is implemented, further groupings, or modifications to the existing ones, are likely to be suggested. The resource groups are Agricultural Sites and Gristmills, Glasshouses, Iron Forges and Furnaces, Maritime Activities, Minor Industries, Sawmills, Settlements, Transportation Routes and Railroads, and Residential Architecture.

The subchapters on each of these resource groups include a historical summary, an identification of resource types likely to be found, a series of research objectives, a list of significant events and individuals associated with each group and guidance for evaluating and recording individual sites.

Many historic resources are related to more than one group. For example, a farmstead would be listed under Agricultural Sites and Gristmills and, if the farmhouse is over 50 years old, Residential Architecture. Evaluation and treatment recommendations should begin with the resource group that represents the primary historic context. Consideration under other applicable resource groups should follow to get as complete an evaluation of significance as practical.

Each resource group subchapter identifies the primary types of structures and other features normally associated with the group. For instance, the subchapter on "Glasshouses" contains a brief history and description (under the heading, "Elements of a Glasshouse Site and the Glassmaking Process") of all those individual "property types" that are likely to be found at a glass manufacturing site. These include all the structures directly involved in glass production (the pot house, lime shed, melting furnace, flattening house and cutting house) as well as the types of buildings one would expect to see in a glasshouse settlement. Not all of these resource types are necessarily significant. An individual type as well as an individual resource should be evaluated within both its geographical and historic contexts.

Agricultural Sites and Gristmills - Agricultural sites include both the berry farms of the central Pinelands and the row crop/truck farms along the periphery of the Pines where the Outer and Inner Coastal Plains meet. Farmsteads from the 17th through the 19th centuries, which exhibit intact features reflective of past agricultural practices, are targeted for special treatment. Also protected are the network of packing, processing and distribution sites by which produce was brought to market. Gristmill sites, which are an extension of an agricultural process, are addressed in this section.

Glasshouses - Approximately 30 glasshouses were in operation at one time or another in the Pinelands, most of them south or west of the Mullica River. Glasshouse sites are defined as the entire community of structures and workplaces associated with the production of glass, including the furnace and related structures, the company store, workers' housing, sand mining areas and product distribution points.

Iron Forges and Furnaces - In many ways similar to the glasshouse sites in their social, industrial and physical development, the bog iron sites are also defined and treated similarly. The entire settlement which the furnace/forge complex spawned is addressed, with various levels of protection for different features based on a site's eligibility for Pinelands designation.

Maritime Activities - These sites encompass a wide range of activities such as shipbuilding, shipping, fishing and navigational aids. Shipwrecks are also included, as are sites where hulks were driven ashore to serve as bank stabilizers. Maritime sites along the coast and up the navigable stream courses of the Pinelands are treated, with special attention given to the older and more intact features capable of yielding new information.

Minor Industries - The minor industrial sites of the Pinelands which appear in the Commission inventories include:

Multiple site industries

- papermills
- cottonmills
- wineries
- clay factories
- collier sites

Single site industries

- tannery (Medford)
- turning mill (Chairville)
- chair factory (Chairville)
- toy factory (Mizpah)

The minor industries may be defined as those sites which were intended to turn out a product and which are represented by a limited number of sites whose impact on the social structure, economy and natural environment was only meager or localized. Particular attention is given to the multiple sites, which had the most significant impact, and to industries which were unique to the Pinelands or whose remnant may provide new information.

Transportation Routes and Railroads - The types of sites afforded protection include railroad related features such as station houses, maintenance barns and components of significant road and waterway routes like bridges, ferry slips, and toll houses.

Sawmills - A recent survey sponsored by the Office of New Jersey Heritage has dramatically increased the number of known sawmills in the Pinelands. The sites are defined as comprising not only the mills, but also the dam and hydropower system and any associated structures.

Settlements - A "settlement" is not a legal entity with specific boundaries like a "township" or "city." In fact, most townships include several settlements. It is a clustering of people and residences, and often workplaces, in a roughly contiguous group that imparts a sense of "place." Its boundaries are simply the outer limits of its built or cleared environment. The recognized settlement types in the Pinelands include:

- milltowns
- resorts
- speculative real estate ventures
- ethnic settlements
- religious settlements
- crossroads settlements
- railroad settlements
- stagecoach settlements
- tavern settlements

Residential Architecture - As defined in the National Park Service survey of Pinelands residential architecture, undertaken at the behest of the Commission, vernacular dwellings are those "designed to reflect local tradition, taste and environment and constructed by community craftsmen with local materials." The survey identified a number of indigenous house types and called for differential treatment of them based primarily on rarity and integrity of design and materials. The survey served as the basis for the subchapter on residential architecture in this plan which was written by architectural historian Susanne Hand.

Recommendations For Treatment

Recommendations for treatment of sites are found at the beginning of Chapter IV; additional guidance for correctly recording specific

types of sites is included at the end of each resource group. The level of treatment recommended for an individual site within a group varies according to the significance accorded the site as well as its physical state of preservation. Where historic resources which do not fall within a recognized resource group are present, an applicant for development approval in the Pinelands may request a Letter of Interpretation in order to determine the degree of significance of the resource and its method of treatment with respect to the development.

These recommendations are not broad generalizations, but specific minimum procedures which should be followed to ensure that the historic component of a site is adequately documented. It is this section in particular which is intended to furnish guidelines to local planning boards for the protection of their historic and cultural resources.

The recommendations section of each resource group is in two parts, evaluation and recording requirements. The evaluation portion includes a definition of what constitutes a "site" within a particular resource group and provides guidance to help in determining the level of significance of individual resources. The term "site" is not limited to archaeological expressions, but also governs those districts, buildings, structures, objects and areas where cultural activity from prior times is attested or suspected.

Treatment procedures are in three categories - preservation in place, preservation at another location and recordation - and flow from this assessment. Pinelands designated sites and those determined eligible for designation must be preserved in situ if this action is feasible. In those instances where such resources cannot be preserved on site, they must either be preserved at an alternative location, if warranted, or recorded in detail. Some other resources, those which are determined to contain "sufficient remains," must also be recorded prior to their removal, but the recording procedures for these sites are less intensive than for well preserved examples that are designated or designation eligible.

Of course, many of the resources that will be evaluated during the review process will qualify for more than one resource group. For example, a building that was originally constructed as an adjunct to a glasshouse operation may have been reused later in an entirely unrelated capacity. Other sites may simply be representative of more than one activity, such as an agricultural building that was part of a bog iron production settlement. The significance of such sites is often enhanced by the fact that they reflect several aspects of historical culture. To ensure that they receive an adequate level of protection, these sites should be evaluated under all resource groups for which they qualify and the most restrictive treatment measure that pertains should be applied.

Although the analysis of each resource group includes a summary of its history and impact on the natural and cultural evolution of the

Pines, this plan is not intended as an historic research document or a systematic examination of indigenous culture. This is a plan exclusively for the assessment and preservation of material culture, the physical remnant of past society. The format employed here reflects its purpose - to aid planners and land use managers in making the difficult decisions they face in the treatment of historic sites, primarily with respect to the review of proposed development. For the purpose of devising treatment alternatives at these sites, the activities that occurred at them must be isolated and examined individually. Although this separation of sites into discrete categories (i.e., resource groups) is acceptable as a preservation planning tool, it does not accurately portray the dynamics of culture in transition. The basic approach does not readily reflect the anthropological perspective, wherein culture is viewed holistically.

Culture may be defined as a series of interrelated and overlapping patterns of acquired behavior. The physical remnant of any activity at an historic site has meaning only as it explains an aspect of that behavioral patterning. The treatment measures for each resource group provide a framework for preserving the information relating to those patterns, but culture is nonetheless more fluid and less subject to compartmentalization than the overall planning structure that is employed here implies. Sites gain or lose in historic value and research potential according to several factors, including their association with other sites, later alterations to them reflective of changing use patterns and any idiosyncratic adaptations to local conditions that they may exhibit. An increase in the existing data base and the redefinition of recognized information goals may also affect their standing. Because of this, discretion should be exercised in applying the recommended treatment procedures. Municipalities should consult regularly with the Commission, the Office of New Jersey Heritage and local historical societies to reassess the status of cultural resources within their purview.

In all cases, however, where a development project will encroach upon an historic site, the preferred remedy among the options for treatment is always avoidance of the site entirely, if at all possible. Protection and intact preservation of historic sites is clearly the primary goal of the relevant state and federal legislation. Regulations implementing the National Historic Preservation Act state, "Upon review of the proposed undertaking . . . the consulting parties shall determine whether there are feasible and prudent alternatives to avoid the adverse effects on a National Register or eligible property" (36 CFR 800.6(b)(5)). The Pinelands Comprehensive Management Plan states similarly, "Where archaeological or historic resources are present, the developer will take all reasonable steps in planning his development to preserve the resource" (N.J.A.C. 7:50-6.158(b)). Although preservation in place is not required in all instances, the principle of avoidance is well established legally and should be the first option considered by anyone who proposes to develop a site containing an historic resource.

Future Planning

Preservation planning is a fluid process wherein existing objectives and treatment formulae are modified to incorporate newly generated information. The Commission has targeted several areas where a greater concentration of efforts in the future is likely to result in a more effective management plan. These areas include the accumulation of inventory data, reevaluation of the resource groups and formation of more comprehensive research designs.

A major factor in determining the very structure adopted for this plan is the level of inventory information available. The present plan had to be formulated to take into account a paucity of existing data and to devise a means in the development review process to increase our level of knowledge. Because so little is known about the physical remnant of most of the resource groups, the plan could not make specific treatment recommendations for the various property types. Instead a vehicle was devised for the initial identification of sites through surveying, followed by evaluation of site significance based on research and educative potential.

Future preservation planning efforts should stress compilation of greater and more reliable inventory information. The benefits that would ensue from such efforts are measurable. Preliminary surveys would be undertaken only in areas where an impact upon an historic site could be anticipated. More comprehensive inventories would also allow for formation of more specific data and integrity characteristics. This would result in clearer and more tightly defined research questions. Property types best able to address these questions could be more easily identified and the amount of useable information generated by excavation and recordation would increase significantly. Documentation efforts at sites about to undergo development would concentrate on those features with the greatest data potential, thereby enhancing knowledge of Pinelands culture while avoiding unnecessary cost and delay.

Upgrading of the present inventory can best be accomplished through Comprehensive Municipal Inventories (see Chapter III) and the federal Certified Local Government program. Surveys at this level of intensity are relatively costly and it should be understood that this is a long term goal for the Commission and Pinelands municipalities. Funding is available, however, for 50% of the cost of such surveys through the federal Historic Preservation Fund. The fund is administered by the Office of New Jersey Heritage (Department of Environmental Protection). Local governments, with the aid of the Pinelands Commission, should explore these means of refining historic sites inventories.

The resource group concept, by which functionally related cultural resources are considered together and evaluated as a unit, is central to the historic preservation planning process. Definition of resource groups at the proper scope and scale will ensure that all the historic sites of the Pines are evaluated correctly, that their level of significance is recognized and that the level of treatment accorded them corresponds to their assessed significance.

As part of the preliminary research for the Comprehensive Management Plan, an inventory of historic sites of the Pinelands was compiled for the Commission and draft "study units" were defined. With slight modification these became the nine resource groups that form the basis of this plan. These groupings were intended to be broadly inclusive so that all identified resources would be contained in one or another of them. They were also designed to be sensitive to the existing level of inventory, which is broad but shallow, with little descriptive information about property types or present status.

The Commission should, in its regular review of the status and implementation of this plan, reevaluate the breadth and content of the resource groups. Realignment of historic resources into new or already existing groups may prove necessary as experience with applying the plan dictates. Discovery of new categories of resources or historic activities may also occasion the formation of new groups. The goal of these reviews is to ensure that the resource groups in the plan accurately reflect historical patterns of cultural activities.

The presently defined research topics and accompanying data are based on an extended series of meetings with south Jersey archaeologists, architectural historians and historic preservationists. The format adopted, which is to define broadly the areas of research concern identified by these professionals and to suggest general avenues of approach to address them in the physical and documentary record, is meant to provide general guidance to consultants devising research and excavation/recordation plans at specific sites. Given the very sketchy and incomplete level of inventory information now available, this seems to be the proper approach for this plan. The "Research Priorities" section of the plan is not at this time meant to provide a specific "game plan" for documenting a site, but to suggest the generally agreed upon gaps in the data base that should be taken into account. Based on an individual site's property types and its state of preservation, a consultant should, in conjunction with the Commission and other local preservationists, determine which research topics can be effectively addressed and proceed accordingly.

A long term goal of the Commission in its cultural resource management program will be the further refinement of the research topics defined to date. As the level of inventory data increases over time, through Comprehensive Municipal Inventories and Certified Local Government surveys, research questions will be more sharply articulated and related to specific property types, data and integrity characteristics and documentary sources. The surveys will provide better and fuller basic information from which the research designs will be reevaluated regularly.

SUMMARY OF PINELANDS HISTORY FROM
THE 17TH TO THE 20TH CENTURIES

Perhaps the first Europeans to set foot in New Jersey were Henry Hudson and his crew members who sailed into Sandy Hook Bay in the late summer of 1609. Hudson and his men had been exploring the coast line further north in a futile search for the northwest passage to the orient. Gradually abandoning these efforts, they began to focus more on the rich, unspoiled lands they were encountering daily as they sailed south and the commercial possibilities that these lands possessed. Hudson was, after all, in the employ of the Dutch East India Company which was principally interested in trade and commerce. After a period of exploration and encounters with the native population, Hudson returned to Europe to present his findings and prepare for further trading voyages. His report aroused great interest among the Dutch who immediately recognized the opportunities presented by the seemingly boundless natural wealth of America.

The Dutch were primarily interested in their newly acquired territories for the mercantile possibilities they afforded and not for colonization. Settlement of the area had to be encouraged, however, if exploitation of the rich natural resources was to occur. The newly formed Dutch West India Company sought to draw settlers to southern New York and New Jersey by instituting the patroon system in 1629. Patroonships were large land grants given to those who agreed to sponsor colonization efforts. The earliest relatively large scale occupation of New Jersey, ineffectual as it eventually proved to be, can be attributed to this grant system.

The early patroonships were concentrated in the far northern part of the state near the more established Dutch settlements on Manhattan Island. Occupation of even this part of New Jersey was sporadic and only partially successful. Provocations against the native Lenape resulted in repeated outbreaks of hostilities in the 1640s and '50s and abandonment of farmsteads west of the Hudson River. In fact, it was not until 1660 that the first permanent town, Bergen, was established in New Jersey.

Occupation elsewhere in the state was even more limited during the period of Dutch control. The Dutch themselves showed little interest in southern New Jersey, other than their Indian trade, until Sweden began initial attempts at colonizing the Delaware Bay area in the 1640s. The Swedes were expelled by a party led by Peter Stuyvesant in 1655 and the minimal settlement in the region was given up. Thus, as late as the middle part of the 17th century, there was little or no European occupation in the southern half of the state.

This first period in New Jersey history, the period of Dutch hegemony lasting from 1609 to 1664, is characterized culturally by trading activities, with little serious attempt at settlement and an extremely sparse physical remnant. Colonizing efforts were minimal and principally oriented toward the sea. Settlement by the Dutch was

half-hearted and short-lived and primarily confined to the coast. Swedish fortifications along the bay and up the river were equally unsuccessful and quickly abandoned under pressure from the Dutch. There is virtually no evidence for settlement at all in the interior of southern New Jersey at this time other than map references to small posts around mid century. Agriculture did not develop until the English occupied the area and the appearance of rural industries was still a full century away. The major activity at the time was whaling, which concentrated particularly in the Delaware Bay. The need for wood for whaling ships prompted early forays into the Pinelands to establish sawmills. Sawyering and fur trading were the causes of the initial exploration of the Pines by Europeans. None of these pursuits, however, has left an identifiable trace in the material record.

In 1664, England seized the Dutch colonies in the New World from the Netherlands, thereby precipitating a radical change in occupational patterns and intensity throughout New Jersey. A period of friction between the two countries precipitated the English action as colonists from New England in the 1640s and '50s attempted to settle in the upper Delaware River region, testing the Dutch resolve. Upon the return of Charles II to the throne in 1660, the English determined to eject the Dutch and sent an expedition to New Amsterdam in 1664 to do so. The expedition was successful and the colonies passed into the hands of the English crown.

Eager to repay those who had been loyal to him during the difficult years of the civil war, Charles conveyed the province of New Jersey to his brother, the Duke of York, even before the Dutch had been expelled. The Duke was granted not only fee to the vast tract between the Hudson and the Delaware Rivers but also the right to govern those lands. He in turn gave over title to the land and, more dubiously, governmental authority to two royalist supporters, Lord Berkeley and Sir George Carteret. Thus began the nearly four decade period of New Jersey as a proprietary colony, split subsequently between East and West Jersey along a line running from Little Egg Harbor to the northwest corner of the province.

The transfer of governmental rights, which would be declared invalid early in the next century, led to the drafting of New Jersey's first constitution, the Concessions and Agreements of 1665, and its first self-governing assembly. The assembly (composed of delegates elected by freeholders), an appointed council and the provincial governor levied taxes, enacted a criminal code and dispensed land. With religious freedom, a generous policy of land distribution and aggressive colonizing efforts, the population of the province began to swell dramatically. By the turn of the century, the number of inhabitants had risen to about 15,000 (from perhaps a few hundred in 1664). In the 1760s, only a century after England seized New Jersey, the population stood at approximately 100,000.

The dramatic influx of settlers served to aggravate a growing problem in the new colony caused by the proprietors' attempt to exert their authority and by disputes over land titles that would become chronic. These problems were only marginally and intermittently

relieved in the ensuing decades as the colony was divided into east and west (upon the death of Lord Berkeley in 1676) and the two halves passed into the hands of an ever increasing number of proprietors holding fractional shares. West Jersey, under Quaker dominion, was somewhat more successfully governed but the long term disputes over land titles and popular resentment against the proprietors over the quit-rent system led to widespread civil disorder and eventually undermined the proprietary governments. In 1702, under a legal challenge to their authority, East and West Jersey yielded their questionable governmental powers and became a unified crown colony.

Establishment of the royal province brought a stability to the government that encouraged economic expansion. The new government consisted of a governor, an upper chamber of the legislature comprising councilmen appointed by the Crown and a popular assembly elected by landowners. Disputes between the governor and the assembly, which controlled financial appropriations, were common and often bitter. Factional rivalries also occurred within the assembly, pitting landholding former proprietors against townspeople and old East Jersey interests against West. Overall, these disputes were without lasting consequence, though the vexing problem of clear title to large tracts of the colony continued to cause unrest into the 1750s and beyond. This problem traced all the way back to 1664 and the original royal grant to the Duke of York. Settlers from that early period gained titles and grants from an agent for the Duke which the proprietors later refused to recognize. The confusion plagued the colony, and later the state, for centuries.

With the end of the French and Indian War in 1763 a chapter in the state's history and the regional history of the Pine Barrens came to a close. Nationally, disaffection with British rule appeared on the horizon. Regionally, the birth of the bog iron industry signaled a change in use and occupation in the Pines. Until the 1760s, the central Pinelands had been markedly underpopulated. Agriculture was by far the major occupation of New Jersey residents and the enormous growth in population in the province was confined mostly to the more fertile areas north and west of the Pinelands. Maritime pursuits, particularly the whaling and shipbuilding industries, continued to be the dominant economic activity of the local inhabitants. Transportation at this time was primarily by boat and those early settlements that were now beginning to appear in the Pines were mostly located along the navigable streams. The practice of shipbuilding expanded enormously during the 18th century. Begun as a satellite industry of whaling, the trade soon grew to encompass a variety of ships and boats. Sawyering also saw a steady increase during this period, primarily to provide wood for ships under construction. The other major rural industries which were to prosper in the Pinelands had not yet made their appearance however.

In 1765, Charles Read, an ambitious Philadelphia entrepreneur, began to buy up lands in the Pinelands in anticipation of establishing the first iron furnaces in southern New Jersey. In the next five years Read built four such furnaces at scattered locations - Aetna (Medford Lakes), Taunton (Medford), Atsion (Shamong) and Batsto (Washington). Though Read himself died in poverty as a result of these ventures, his enterprise had an effect on the settlement patterns, social structure

and cultural history of the Pine Barrens that persisted for a full century. The founding of the bog iron industry precipitated the first major sustained growth period in the region and the imposition of an extensive physical infrastructure to service a burgeoning population.

In New Jersey as well as nationally the latter 1760s and 1770s is the period when a national consciousness began to take shape in the minds of many colonists. At the close of the French and Indian War in 1763, however, no such spirit was evident. It was not until the mid 1770s that the general discontent with actions of Parliament led to a genuine separatist movement. Dissatisfaction with English policies first arose in 1765 with passage of the Stamp Act. Colonial resentment ran high against this initial imposition of a tax which benefited only the mother country, without consultation or representation of the colonists. Although discontent was nearly universal among the populace of New Jersey and elsewhere, no movement for independence coalesced until considerably later. Under pressure from the colonies, the Stamp Act was soon repealed, but equally unacceptable revenue measures followed. The overall effect of these tax acts was to cause many Americans to reassess their relationship with Britain. By 1775, when hostilities broke out in Massachusetts, large numbers had decided it was time to sever the remaining bonds.

During the Revolution, New Jersey, located as it is between the principal commercial centers of New York and Philadelphia, was a major theater of war. Washington and a succession of English commanders criss-crossed the state repeatedly in a long series of tactical maneuvers and skirmishes of varying intensity. A clear advantage was never gained by either side, but Washington's army succeeded insofar as it remained a cohesive force and prevented the enemy from occupying the state unchallenged. This was particularly important because of New Jersey's strategic location and because of its vital contributions of materiel to the continental cause. During the course of the war, the state was instrumental in yielding up much needed foodstuffs as well as the output of its newly emerging rural industries. In the Pinelands, the furnaces founded by Charles Read a decade earlier became suppliers of cannon and shot to the revolutionary army. The tavern at Washington, a satellite village for nearby iron sites now in Wharton State Forest, served as a recruiting post for the American army. Privateers licensed by the fledgling Continental Congress operated with great success out of numerous south Jersey landings. Their harassment of British shipping precipitated the famous retaliatory strike at Chestnut Neck. This was followed up by the attempt of a British squadron to sail up the Mullica River to Batsto to destroy the iron furnace there. The English withdrew, however, when they learned that a contingent of Pulaski's soldiers was in the area. The bog iron forges and furnaces of the Pines and the farms along the western and northern periphery continued to supply Washington's troops throughout the war.

At the end of the war, and for a long while thereafter, America was still very much an agrarian society. Cities were small and few and the great majority of the population was scattered across the landscape, on farms and in small villages. The process of industrialization began soon after independence, however, with the founding of the first planned

industrial communities in the United States in Paterson, New Jersey, and Lowell, Massachusetts. Prior to this, the British had suppressed all attempts to establish a native industrial base in America.

In the early period of the Industrial Revolution, before a premium was placed on consolidation and centralization of efforts, manufacturing sites were numerous and diffuse and rural industry flourished. Proximity to exploitable natural resources and, of course, to a hydropower source, seems to have been the major siting considerations. This phenomenon persisted through much of the 19th century, only gradually giving way to more efficient integrated systems in the latter 1800s. Thus, the Pinelands, as well as other relatively remote rural areas of America, was able to support expanding industrial production through several decades of the 19th century. With industry came a dramatic increase in population, an improved transportation network and an extensive settlement and cultural infrastructure.

Nationally, the inexorable trend toward an urban industrial society continued throughout the 19th century, fueled by a seemingly endless supply of cheap immigrant labor. A dreadful economic cycle of expansion and contraction characterized the period though. War with England in 1812 initially helped consolidate American industry as the blockade of U.S. ports slowed cheap imports to a trickle. With the end of the war, however, came a flood of imports and a near collapse of the native manufactory. Thereafter, short-term but severe nationwide depressions or "panics" occurred at roughly twenty year intervals through the rest of the century.

This period in Pinelands history can be said to conclude ca. 1860 with the onset of the Civil War. The bog iron industry, which had nurtured and shaped this expansive chapter in Pine Barrens subculture passed into history at the end of the decade. As a determinant of settlement its place was taken at this time by the newly formed railroad lines which began operating in the Pines in 1854. Though iron smelting was no longer practiced, other Pinelands industries continued into the latter 19th century. Glass production, which started at Wistarburgh in 1739 and began in the Pine Barrens in 1799 at Port Elizabeth, grew steadily in the early 1800s, levelling off around mid century. After the 1860s, factory closings began to outpace new production sites as a few large companies came to dominate the field.

The minor industries of the Pines also had their start and early growth in the 1765-1860 period. Paper production began at Harrisville in 1832-1835 and expanded in the second half of the century, lasting until the mill at Pleasant Mills closed around 1925. Textile weaving started before 1828 at Retreat Factory in Southampton. None of the three known mills in the Pinelands was long lived though and production ceased altogether when the mill at Atsion closed in 1882 or shortly thereafter. Wine making began toward the end of this period and today is the only significant historical minor industry of the Pines that is still practiced on any scale.

Sawyerling was probably more actively practiced during this period than at any other time in Pinelands history. The demand for wood for

the bog iron and glass furnaces as well as for shipbuilding provided a constant and ready market. Maritime pursuits in general thrived during the later 18th and 19th centuries. The ports-of-call along New Jersey's coast were particularly prosperous in the 1700s as were south Jersey shipyards, which eventually built ships of 500 tons and larger. Only the whaling industry, which was so instrumental in the early settlement of the Pine Barrens, disappeared, as did the whales themselves from overhunting.

The first significant settlement and transportation structure in the Pinelands interior developed during this era, largely as a result of iron and glass production. These labor intensive industries spawned settlements around the furnaces, with a distinctive socio-cultural and economic system, as well as a series of villages that grew near roads and landings. Many of these were to disappear in the succeeding period as the railroads and changing land use patterns rendered them remote.

The industrialization of America may be said to be the major cultural and historical theme of the latter 19th and early 20th centuries. This movement brought with it enormous social, economic and cultural geographic consequences. The period corresponds to an era of massive immigration in the United States, with marked increases in population, particularly in the northeastern states, and a tendency toward urbanization of the populace. All these conditions are precisely mirrored in New Jersey, which saw its population approach two million (almost one-quarter of them foreign born) by the turn of the century. This was double what it had been only thirty years earlier.

The period inaugurates with the Civil War, which caused a manpower drain that may have hastened the demise of the south Jersey bog iron industry. Sentiment throughout New Jersey concerning prosecution of the war was decidedly mixed. There was even a strong current of thought that favored secession in 1861. In 1862, Joel Parker, the candidate of the Democratic Party, which had opposed the war and was generally lukewarm in support once hostilities began, was elected Governor of the state. This uncertain allegiance continued until 1865 when the Republican Party succeeded in recapturing the governor's office and in ratifying the Thirteenth Amendment (abolition of slavery).

Following the Civil War the drive toward industrialization accelerated. The number of mills in New Jersey more than doubled between 1870 and 1900, encouraged by generous taxation and incorporation laws. Mass immigration, especially of Irish and Germans and later of Italians, continued essentially unabated, despite the efforts of the nativist movement of the time. In New Jersey, all of these trends were far more prevalent in the north than the south. The cultural map of the Pinelands was more affected by developing transportation networks in the period 1860-1920 than by industrialization. New settlements gravitated around the rail lines, including the emerging agricultural communities fostered in part by the widespread commercial cultivation of the cranberry beginning in the 1850s. Older settlements in the Pines, oriented as they were toward the earlier 19th century rural industries, were abandoned in large numbers. Much, if not most, of the growth and new development in the Pinelands was along the coast, encouraged by the

improving road and rail systems. Contrary to the national trend, the major industries of the region did not greatly prosper and, in fact, declined in the early 20th century. Without a strong industrial base, population growth levelled off and shifted away from the more remote interior toward the transit/transport routes and the eastern and western peripheries.

The erosion of the industrial capacity in the region extended to the minor manufactories and to shipbuilding as well. Textile weaving, paper production and ship construction all ebbed or ceased by the early 20th century. Agricultural output continued, though much changed by the development and growth of berry agriculture and truck farming and by the conversion to market oriented production by row crop farmers.

Maritime activities declined along the south Jersey coast as the 19th century progressed. Shipbuilding was reduced to production of the small specialty vessels and pleasure craft that are still made today. Shipping ports were eclipsed by bigger and better harbors elsewhere and the upriver landings gradually fell into disuse. With a static or even declining population throughout most of the region, the Pinelands assumed a reduced level of physical culture. This condition characterized the area until well into 20th century. Only recently has a renewed interest in development of the area focused attention on the development that has already occurred here, some of it more than two centuries ago.

CHAPTER I

DESIGNATION OF SIGNIFICANT CULTURAL RESOURCES OF THE PINELANDS

The Comprehensive Management Plan provides a program for the designation of historic and prehistoric resources of significance to the nation, state, local community or the Pinelands (N.J.A.C. 7:50-6.154). This program is similar to the State Register of Historic Places (N.J.S.A. 13:1B-15.128 et seq.) and the National Register of Historic Places (36 CFR 60) and in fact all sites listed on either the State or National Register are considered to be automatically Pinelands Designated (N.J.A.C. 7:50-6.154(a)). However, Designation differs from Register status in several important aspects. Whereas entry on the State or National Register imposes no restrictions on an owner's use or alteration of a listed property, a Designated site in the Pinelands may not be altered or modified without a certificate of appropriateness. The certificate of appropriateness (see Chapter III) is issued by the local municipality (or, in the case of an uncertified municipality, by the Pinelands Commission) and details the precise treatment which will be required for the site in order to protect its historic integrity. This will involve one of three alternatives - preservation in place, preservation at another location or full recordation of the resource - which must be carried out according to the Secretary of the Interior's Standards for Historic Preservation Projects. If a resource is to be preserved in place (which is the preferred treatment), the Secretary's Standards require that it also be maintained in a manner that enhances those characteristics that contribute to its historicity. If it is not possible to maintain a resource at its original location, it may be moved to a site that complements its heritage so long as its essential historic fabric is able to be preserved. If neither of these alternatives is feasible, the resource must be carefully documented before it is removed.

Process of Designation

The procedures for designating a resource as historic are described in N.J.A.C. 7:50-6.154(c)-(e). A site may be designated by either a municipal governing body (Local Designation) or by the Pinelands Commission (Pinelands Designation) and any individual or organization may submit an application. Although the effects of both Local and Pinelands Designation are essentially the same, only Pinelands Designated sites (including those on the State or National Register) are afforded protection automatically from projects initiated by county, state or federal government.

Designation can also be accomplished through creation of historic landmarks and/or historic districts pursuant to the provisions of the Municipal Land Use Law (MLUL), N.J.S.A. 40:50D-107 et seq. The designation must take the form of an amendment to the local zoning ordinance and must be reflected in the master plan. The MLUL further requires that an historic preservation commission (HPC) be created if in fact any resources are formally designated. Municipalities would be

well advised, however, to create an HPC prior to the designation of any sites so that the commission can lend its advice and expertise to the selection process. Once the designations have been adopted by the governing body, the HPC can serve in either a decision making capacity or as advisor to the planning board on applications for permits at landmarks or in districts. The HPC can also provide advice to the planning board and board of adjustment on applications for development which will affect undesignated historic resources regulated by the CMP (pursuant to N.J.A.C. 7:50-6.155 et seq.) and by the provisions of this cultural resource plan. The Pinelands Commission has available a model historic preservation ordinance which includes provisions for evaluating and treating significant resources and defines the role of an HPC in the preservation process. Municipalities interested in creating an HPC, either to advise generally on historic preservation issues and implementation of the CMP provisions or to oversee a survey to identify sites for formal designation, should contact the Commission for further guidance.

An application for designation must be submitted to either a municipal planning board or to the Pinelands Commission. If the application is for Local Designation, it shall be reviewed by the HPC (if one exists) and planning board and forwarded to the governing body with a recommendation for action. If Pinelands Designation is sought, the nomination should be submitted directly to the Commission. The applicant must submit his information on a National Register of Historic Places Inventory - Nomination Form and must provide additional information if requested by the planning board or the Pinelands Commission. If Pinelands Designation is proposed, comments by the planning board on the nomination are also required.

Two documents, the National Park Service's How to Complete National Register Forms and the Office of New Jersey Heritage's State and National Registers Manual, provide detailed guidelines for preparing Register forms. These publications may be used for guidance in preparing Pinelands Designation applications.

Once an application has been submitted, the nominated resource will be evaluated by the Commission or planning board according to four specific criteria of eligibility (N.J.A.C. 7:50-6.154(b)1). These criteria are virtually identical to those used for the State and National Registers and include the following:

- i. The presence of structures, sites or areas associated with events of significance to the cultural, political, economic or social history of the nation, state, local community or the Pinelands; or
- ii. The presence of structures, sites or areas associated with the lives of persons or institutions of significance to the cultural, political, economic or social history of the nation, state, local community or the Pinelands; or
- iii. The presence of structures that represent the work of a master, or that possess high artistic values, or that embody the

distinctive characteristics of a type, period or method of construction, or that represent a distinguishable entity of significance to the architectural, cultural, political, economic or social history of the nation, state, local community or the Pinelands; or

iv. The presence of a site or area which has yielded or is likely to yield significant information regarding the history or archaeological history of the Pinelands.

In addition, the resource must have retained its historic integrity, which refers to the physical characteristics and appearance of the resource. Integrity does not mean physical condition. A building may be in need of painting and repair, but it has integrity if its architectural features and form have survived from the period for which it is significant. If, for example, a building is significant for association with a person or event of the 1860s, it should substantially retain its 1860s physical appearance.

Integrity, however, is relative. No historic resource comes to us as if in a vacuum from its period of significance. Changes occur over time. Integrity deals with the nature and extent of change.

Integrity is defined in terms of location, setting, design, materials, workmanship, feeling, and association. A resource generally should meet all of these integrity standards to some degree. Integrity is relative, and the type and degree of integrity a resource should possess is related to the intrinsic significance of the resource. In general, resources that are very rare or exceptionally significant do not have to meet as high a level of integrity as those that are more common.

Integrity of location is simplest to define and determine. A building or structure that has been moved does not meet integrity of location. A moved building or structure is not eligible for Pinelands Designation unless it is of exceptional architectural or historical significance.

Integrity of setting refers to the surrounding environment. This is particularly important for those resources whose significance is related to exploitation of the surrounding natural environment, such as farmsteads.

Integrity of design, materials, and workmanship refer to the design and construction of the resource. Design involves its form, function, plan, and details. Materials and workmanship show how the design was executed.

Integrity of feeling and association are less tangible qualities. A resource with integrity of feeling evokes a sense of the past. Association is the direct link between a resource and a person or event. These qualities are dependent upon the perception and imagination of the viewer. A degree of consensus among local people can be used as the standard for evaluating integrity of feeling and association.

Frequently, the physical changes to a resource over time are significant in themselves. A resource may represent more than one period or type of significance. A resource should be evaluated for its aggregate of significance, with evaluation of integrity for each period and kind of significance, whenever possible.

Those kinds and periods of significance for which a resource has lost integrity may represent important historical background information, but no longer represent eligibility for that particular aspect of significance. For example, an eighteenth century inn may be significant for its role as a stagecoach stop from 1780 through 1850 and for its Georgian architecture. If it was substantially altered in 1920, it may no longer possess integrity for its eighteenth century architectural significance or its eighteenth and nineteenth century historic significance. If, however, in 1920, it was transformed into a log cabin resort, an appearance it retains to the present, it may be eligible for designation as representing twentieth century Pinelands resorts and resort architecture.

How to Apply the National Register Criteria for Evaluation, a publication of the National Park Service, provides further guidelines on significance and eligibility generally applicable to Pinelands Designation. Chapter IV of this plan provides more explicit standards for evaluating significance and integrity for each resource group.

Surveys to Determine Eligible Properties

Municipalities that wish to institute a comprehensive program of designating historic resources must first determine how many there are and where. This task is best accomplished under the direction of a historic preservation commission (HPC) created pursuant to the provisions of the Municipal Land Use Law (N.J.S.A. 40:55D-107 et seq.). Once the HPC has identified the eligible resources, its report can be presented to the planning board and the governing body with recommendations for inclusion in the master plan and for designation of historic landmarks and districts in the zoning ordinance.

The Office of New Jersey Heritage (N.J. Department of Environmental Protection) has a grant program specifically designed to promote county and municipal surveys of cultural resources. The grants are provided through the United States Department of the Interior Historic Preservation Fund and are available to governments and non-profit agencies. Grant moneys are extended on a 50/50 matching basis and donated volunteer time can be used as a part of the local match. The Pinelands Commission will give technical assistance to municipalities that wish to apply for grant funding for purposes of identifying resources for subsequent Designation.

Municipalities might also consider coordinating their efforts and jointly sponsoring a regional survey. This would be particularly cost effective and appropriate for towns in the Preservation Area, where the comparatively small number of buildings fifty years and older and the

minimal threat from potential development make a regional survey an appropriate scale for identifying and evaluating standing buildings and structures in these areas. Regional surveys can also be undertaken for two or three adjacent municipalities outside the Preservation Area that do not have large numbers of older buildings.

Regional surveys that do not follow municipal boundaries and surveys that include all types of resources -- historic, architectural, and archaeological -- would also be invaluable. A survey of both extant and abandoned settlements along both sides of the Mullica River would be an example of a regional survey and would be an alternative to township wide surveys of Mullica and Washington Townships.

All new surveys should incorporate relevant information from previous surveys and from the Pinelands Commission inventories. The survey should be geared to the types of resources within the survey area and the nature of the threat to those resources. Wherever possible, these considerations should be indicated directly on the survey form. In general, state survey forms from the Office of New Jersey Heritage (ONJH) should be used. Most resources should be recorded on an Individual Structure Survey Form. As these forms are relatively open forms, designed for professional use, they are readily adaptable to incorporate data on potential threats and appropriate treatment.

The deadline for applications for the Historic Preservation Fund grants is generally in February or March of each year. Further information on the grant program is available from ONJH in Trenton.

Certified municipalities may also at their option undertake a "Comprehensive Municipal Inventory" of historic and prehistoric sites within their jurisdiction (see Chapter III). This is intended primarily as an authoritative listing of all such sites which the local permitting agency could refer to in determining the need for a cultural resource survey in a development project. Adoption of such an inventory would serve to provide applicants for development approval with a quick, easy and reliable method of determining whether a cultural resource survey will be required at their project sites. The inventory is doubly useful as a tool in long term preservation planning and it can serve as the basis for an historic preservation plan element in a municipal master plan (cf. N.J.S.A. 40:55D-28b(10)). It can furnish officials with an overview of the status of cultural resources locally so that significant sites can be targeted for designation. The inventory will also benefit a municipality by providing advance notice for land use planning purposes of areas of historic sensitivity; by helping to identify potential historic districts and properties eligible for Tax Reform Act incentives; by furnishing information useful for public education and school programs; and by promoting pride and public appreciation of each municipality's varied past. Guidelines for compiling comprehensive municipal inventories are included as an appendix to this report.

CHAPTER II

CERTIFICATES OF APPROPRIATENESS

Certificate Required for All Significant Sites

As adopted in 1980, the Pinelands Comprehensive Management Plan established a process to protect cultural resources of particular significance in the Pinelands. The Plan initially designated nine historic sites, structures, or districts as cultural resources of significance to the Pinelands and established criteria to be used in evaluating additional resources for this designation. These criteria are virtually identical to those used for entry on to the State and National Registers of Historical Places and are cited in Chapter I (see pp. 19-20).

Once designated, the resource was afforded additional protection under the terms of the Plan. A certificate of appropriateness was required from a local planning board, board of adjustment or historic preservation commission, in the case of municipalities which had their master plans and land use ordinances certified by the Commission, or from the Commission itself in towns which had yet to receive certification, for development activities which would impact upon the resource. The Plan also contained a series of standards which governed the issuance of the certificates of appropriateness.

The 1987 amendments to the CMP contained provisions which clarified the type and level of treatment which would be required at historically significant sites and expanded the number of sites which qualified for this treatment. All sites which are listed on the State or National Registers of Historic Places are now considered to be automatically designated and the requirement for a certificate of appropriateness has been extended to sites found to be eligible for designation pursuant to a cultural resource survey. The Commission also issues the certificate in cases where development is proposed by county, state or federal agencies and reviews any locally issued certificates of appropriateness before project operations may begin. A certificate of appropriateness is in force for a period of one year, after which time, if the resource has not been formally designated locally or by the Commission, the treatment requirements no longer apply.

The CMP revisions also provided for greater protection of significant resources by broadening the range of activities that require a certificate of appropriateness. The regulations now clearly state that any "disturbance" of or "encroachment upon" a resource or an action which "renders a resource inaccessible" has an impact upon the resource which necessitates a certificate.

Provisions Governing Issuance of a Certificate

The provisions in the Comprehensive Management Plan that relate to certificates of appropriateness are contained in N.J.A.C. 7:50-6.156. They detail the circumstances under which a certificate is required, the

application procedures, the standards by which they are issued and the effects of issuance.

A certificate of appropriateness is required before virtually any action is permitted which will alter a designated site in any way, irrespective of whether the action constitutes "development" according to the CMP. Additionally, if a cultural resource survey required pursuant to a development application (N.J.A.C. 7:50-6.155(a); also see Chapter II) uncovers a resource which is eligible for designation (according to the criteria in N.J.A.C. 7:50-6.154(b) and in Chapter I), a certificate of appropriateness is required before the development can be approved.

The certificate is intended to define the specific treatment which will be required for the resource in order to preserve it to the extent possible. This will involve a choice among three broadly defined alternatives: preservation in place, preservation at another location and recordation. The method by which the appropriate alternative is determined and the specific requirements of each are detailed in Chapter IV (see p. 33).

An application for a certificate of appropriateness is submitted to a local permitting agency in certified municipalities or the Pinelands Commission in uncertified municipalities. The local permitting agency will be the planning board, board of adjustment or historic preservation commission (if one has been created), depending on which body is otherwise empowered in the zoning ordinance to review the proposed development. County, state or federal agencies which are planning a project that will affect a Pinelands Designated or eligible property must submit their application directly to the Pinelands Commission.

The application will consist of detailed plans depicting the work to be undertaken and a narrative statement indicating how the work will affect the historically significant characteristics of the resource and how it will meet the specific treatment requirements for designated sites (N.J.A.C. 7:50-6.156(b)). The Commission or the local permitting agency, as the case may be, may also require any additional information necessary for its review.

Additional Protection Through Zoning Flexibility

The process governing the issuance of Certificates of Appropriateness does not anticipate that all designated resources or sites eligible for designation will be preserved in their entirety. A variety of factors and circumstances will ultimately dictate the level of treatment afforded to a resource by a development applicant. It is possible, however, that additional protection of sites which might otherwise be lost in part or whole can be taken by affirmative action on the part of governmental agencies. The revisions to the Comprehensive Management Plan now provide for waivers of strict compliance from CMP land use and environmental standards if the proposed development and use is the only viable means of protection for a significant resource.

Local permitting agencies can also consider a similar approach and grant variances relating to density, permitted uses, minimum lot areas, and bulk requirements which in certain cases may permit a resource which might otherwise be lost to be protected. One example of such a step is to permit more intensive clustering of residences on a portion of a site than would otherwise be permitted by the local ordinances so as to avoid disturbance of a resource located on another portion of the property. In the cited example, the zoning district density need not be varied but minimum lot area requirements would be reduced.

Such actions, as well as public acquisition (in fee or easement), should be considered in instances where development would result in the partial or total loss of a resource. Although these steps neither can nor should be mandated, it is appropriate to require that they be considered by the local permitting authority as part of the cultural resource review process.

CHAPTER III

MEASURES FOR IDENTIFYING HISTORIC SITES
IN THE DEVELOPMENT REVIEW PROCESS

The recommended treatment measures included at the end of each resource group detail the procedures to be followed at development sites once an historic resource has been discovered and identified. Prior to this, however, development applications must first be reviewed to determine if in fact there are any such resources present on the site at all. The provisions outlined below are intended as guidelines for this initial review process.

The Comprehensive Management Plan requires that a cultural resource survey accompany all applications for development in Pinelands Towns and Villages and for major development elsewhere (N.J.A.C. 7:50-6.155(a)1.; the definitions of "development" and "major development" are found in N.J.A.C. 7:50-2.11). This requirement may be waived if it is determined that there is little likelihood of any cultural resources on the site. Applications for minor development do not generally require such a survey because of the small areal impact of these projects and, consequently, the low probability of intrusion upon an historic site. Nevertheless, the possibility exists that even relatively small development projects may have an adverse impact upon a known or an as yet undiscovered historic resource. Since this possibility increases markedly when development within or near a traditional settlement is proposed, the requirement for a survey has been extended to minor development in the Towns and Villages. The Commission has published a study of the historically sensitive portion of these communities called Pinelands Towns and Villages: Historic Area Delineations which is available to municipalities without charge. Following is a list of these sites within the Pinelands Area arranged alphabetically by municipality:

<u>Barnegat</u>	<u>Dennis Township</u>
Brookville	Cumberland-Hesstown
<u>Bass River Township</u>	Dennisville
New Gretna	Eldora
<u>Buena Boro</u>	North Dennis
Buena	<u>Egg Harbor City</u>
Landisville	Egg Harbor City
<u>Buena Vista Township</u>	<u>Estell Manor City</u>
Milmay	Estell Manor
Newtonville	<u>Folsom Borough</u>
Richland	Folsom

Galloway Township

Cologne-Germania
Pomona

Hamilton Township

Laureldale
Mizpah

Hammonton Town

Hammonton

Jackson Township

Cassville
Legler
Vanhiseville

Lacey Township

Bamber Lake

Lakehurst Borough

Lakehurst

Manchester Township

Whiting

Maurice River Township

Cumberland-Hesstown
Delmont
Dorchester-Leesburg
Port Elizabeth-Bricksboro

Medford Township

Lake Pine
Taunton Lake

Mullica Township

Elwood
Nesco
Sweetwater
Weekstown
Wescoatville

Ocean Township

Brookville

Pemberton Township

New Lisbon

Port Republic City

Port Republic

Shamong Township

Indian Mills

Stafford Township

Warren Grove

Tabernacle Township

Tabernacle

Upper Township

Petersburg
Tuckahoe

Washington Township

Green Bank
Jenkins
Lower Bank

Weymouth Township

Belcoville
Dorothy

Winslow Township

Blue Anchor
Elm
Tansboro
Waterford Works
Winslow

Woodbine Borough

Woodbine

Woodland Township

Chatsworth

Since a Certificate of Filing (in certified municipalities) or Certificate of Compliance (in uncertified municipalities) must be issued by the Commission before a development application is reviewed by a municipality, the Commission is afforded a direct opportunity to determine whether or not a cultural resource survey is required. If a Certificate is issued without comment as to historic sites, the requirement for a survey may be considered waived and the local permitting agency may then process the application. Should the Commission receive information subsequent to the issuance of a Certificate that an historic site may be adversely affected, the applicant and municipality will be notified via a Decision to Review Local Approval (N.J.A.C. 7:50-4.22(a)). Cultural resources discovered subsequent to the beginning of construction should also be protected from indiscriminate alteration or removal. In accordance with N.J.A.C. 7:50-6.158(b), an applicant must notify the Commission and take all reasonable steps in planning his development to preserve the resource, or if on-site preservation is impractical, to protect the data.

Many applicants may not be aware that a cultural resource survey may be required as part of a development application. This can result in unanticipated delays and frustration if the survey is undertaken only at the very end of the application process. Should significant resources be encountered which require treatment measures, the problem can be further compounded. For this reason it is important that municipalities and the Commission inform applicants early on that a survey may be required and that important historic resources discovered at development sites will be protected according to the provisions of N.J.A.C. 7:50-6.156 as reflected in the local zoning ordinance.

In all cases where a survey requirement may be imposed, the determination as to the need for a survey should be based on a review of the nature of both the development project and the site where it is to occur. The criteria which should be used to indicate that a waiver of the survey is warranted are:

1. there is insufficient evidence of cultural activity on the project site;

2. the evidence of cultural activity on the site lacks importance because further recording of the available data will not contribute to a more comprehensive understanding of Pinelands culture; or
3. the evidence of cultural activity lacks significance because it fails to meet any one of the following standards:
 - a. association with historic events or people of importance to the cultural evolution of the Pinelands;
 - b. buildings and structures that are of high artistic value or are the work of a master, or that characterize a specific type, period or method of construction, or that represent a significant and distinguishable entity whose components may lack individual distinction;
 - c. the potential to yield information significant to the cultural evolution of the Pinelands.

Within the context of these criteria, the most difficult type of decision to make is the need for a survey of archaeological sites. These generally attain significance through the final criterion, "the potential to yield information." Many valuable sites, including virtually all those of the Amerindian periods, have left no historical record and are not easily detected by a surface inspection. Hence it is often difficult to decide if a survey to determine the existence of such a site is necessary. In these cases, a survey should be required under following circumstances:

- Confirmed sites: the presence of known historic or prehistoric sites within the project area.
- Proximate sites: the presence of a series of prehistoric sites in the same general environs as the project area.
- Massive disturbance: a development project that will cause ground disturbance over a large areal extent.
- Surficial alterations: alterations to the natural environment, caused by historic period cultural activity, of a type that can not be dismissed as historically insignificant or unworthy of archaeological investigation.
- Topographic indications: the presence of topographic features (relict periglacial features, *cuestas*, surface water course, etc.) commonly associated with prehistoric site occurrence.

Of course, the opportunity will still exist for an individual to request a "Letter of Interpretation" (N.J.A.C. 7:50-4.71 et seq.) as to the need for a survey before filing an application for development with the Commission. This is not only a time saving device for the applicant, but can also serve to highlight important planning information early in the stages of project design. The Commission will

respond to a request for a Letter of Interpretation within 45 days of its receipt.

If a cultural resource survey is deemed necessary, it must be carried out according to guidelines referenced in the Comprehensive Management Plan (N.J.A.C. 7:50-6.155(a)1.) and included here as Appendix B. These guidelines are meant to ensure that a thorough investigation of the site's potential to yield useful information is undertaken prior to construction.

Municipalities that have required a cultural resource survey are encouraged to consult with the Pinelands Commission in the review of the resulting report to ensure its completeness and accuracy. This consultation should take place prior to issuance of any development approval. A copy of the survey report should be sent to the Commission so that there is a central collecting point for future reference and research into Pinelands history and prehistory.

Municipalities may also consider requiring that development applicants pay a certain amount into an escrow account to ensure that moneys are available for a survey, if one is necessary. Many municipalities presently have in their existing ordinance provisions for similar escrow accounts for traffic engineering studies and other preliminary consultant reports. The escrow funds would be used to pay for the services of a designated "municipal archaeologist" who would perform surveys as needed. To be appointed as a municipal archaeologist, a consultant should have to meet the professional qualifications referenced in the Commission's guidelines (Appendix B). By adopting such a provision, municipal officials would be assured reliable, accurate reports from an archaeologist of their own choosing without incurring an expense to the town budget.

While these procedures for identifying significant cultural resources are not flawless, they do represent a balanced approach which can work effectively with the cooperation of municipal officials and development applicants. For its part, the Pinelands Commission will attempt to advise municipalities and applicants as needed throughout the review and survey process. The Commission staff is available to aid local permitting agencies in determining which applications will need surveys. Applicants may come to the Commission for Letters of Interpretation and for advice in expediting required surveys. The Commission maintains lists of preservation consultants who have successfully completed surveys in the past and will counsel applicants as to the most appropriate treatment alternative for their site. The Commission is also trying to keep development costs down by encouraging greater numbers of consultants to compete for the required surveys.

Role of the Comprehensive Municipal Inventories

The Comprehensive Municipal Inventory (CMI) program, referenced earlier in Chapter I, provides Pinelands towns with the ability to identify those areas with a cultural resource concern, well in advance of anticipated development. Compiling a CMI is not a requirement of the

Comprehensive Management Plan, but it is strongly recommended to townships as a means of facilitating the local application review process. An inventory which is developed by a qualified consultant and certified by the Pinelands Commission allows a municipality to make what is essentially a final decision as to the need to survey for historic period sites prior to beginning development. Although the Commission retains its review and "call-up" powers, a bona fide decision based on the inventory should be accepted by the Commission. This expedited review process should make towns with a certified CMI more attractive to developers.

The results of the inventory should be reflected in the municipal master plan so that local comprehensive planning efforts can incorporate preservation concerns. Amendments to the Municipal Land Use Law adopted in 1986 specifically provided for an historic preservation element as an optional component in a master plan (N.J.S.A. 40:55D-28b(10)); a certified CMI can serve as the basis for this element.

The end result of a CMI will be a compendium of known resources and historically sensitive and non-sensitive areas that is directly translatable to development review decisions. The inventory will be more than a simple directory of historic sites because it will group all resources and areas of a township into one of five categories and provide survey recommendations accordingly. The five categories include:

- Category I - Sites/areas possessing resources that are on or have been determined eligible for the State or National Registers or that have been locally or Pinelands designated.
- Category II - Sites/areas possessing resources of possible, but as yet undetermined, significance (as defined by the criteria for Pinelands Designation).
- Category III - Areas where access was not gained because of owner objection and thus the historic potential is undetermined.
- Category IV - Sites/areas not eligible for Pinelands Designation or the National Register, but possessing a cultural remnant reflective of patterns of land use and requiring minimal recording.
- Category V - Sites/areas where there is no evidence of a cultural activity or none that requires further documentation.

The CMI's are not designed to address the incidence of prehistoric site occurrence within a township. This is because of the greater difficulty and expense involved in identifying Native American sites,

which are usually represented by no more than a scattering of lithic artifacts at the surface. The Commission is presently involved with Temple University in the development of a predictive model of prehistoric site occurrence. This should help resolve the problem of locating and evaluating American Indian remnants of possible significance which may be affected by development.

The model is intended to identify various environmental factors which may or may not have been attractive to ancient peoples and then, through a random sampling strategy, determine those which were actually exploited. From this information the likelihood of prehistoric sites throughout the region can be projected. Once the model has been fully developed, the results will be made available to Pinelands municipalities for planning or permit review.

Complete guidelines for assembling comprehensive municipal inventories are found in Appendix A. Towns interested in compiling an inventory should contact the Commission.

CHAPTER IV

EVALUATION AND TREATMENT OF THE NINE PINELANDS RESOURCE GROUPS

General Evaluative Criteria

This cultural resource management plan is primarily structured for, and intended to be implemented by, Pinelands municipalities. The identification, evaluation and, most importantly, the treatment of individual historic properties can best be accomplished through comprehensive municipal inventories and conservation/research programs. However, it is unlikely that many Pinelands municipalities will have the capacity to undertake such a multi-faceted program within the next several years. Consequently, it is expected that the regular means of plan implementation will be achieved through the development review process, i.e., those procedures and requirements which govern the approval of individual private and public development projects within the Pinelands.

The review process not only addresses the survey and identification of historic resources on individual properties, but also the methods of evaluating and treating those resources once they have been identified. Some sites may well be identified as belonging to more than one resource group. In such instances the site should be evaluated according to all the resource groups that pertain and the most restrictive treatment measures that apply should be followed.

The purpose of the evaluation process is to determine whether a particular cultural resource is significant in terms of history, architecture, archaeology and culture. To be judged significant, a site must meet one or more of the criteria of eligibility for Pinelands Designation (see Chapter I, pp. 19-20). These qualities generally allude to a site's architectural merit, its ability to provide new information about patterns of culture, or its association with persons or with events prominent in local, state or national history. A site must also retain substantial physical integrity, i.e., those characteristics and features that it had during the period when it acquired historical consequence. This information can be obtained through initial data collection efforts undertaken as part of a cultural resource survey.

For each of the nine recognized resource groups in the Pinelands there are additional specific guidelines for determining whether a particular site possesses research potential or architectural merit or is associated with prominent persons or events. These guidelines are contained in the "Special Evaluation and Recording Requirements" section at the end of each of the resource group sub-chapters that follow.

This evaluation process, i.e., the application of both these general requirements and the resource specific requirements, will result in a determination that a site qualifies for one of four different categories of physical remnants:

- o sites which have received Pinelands Designation pursuant to N.J.A.C. 7:50-6.154;
- o sites which are deemed eligible for Pinelands designation and thus are considered to be significant resources;
- o sites which are said to contain sufficient remains because they present graphic evidence of a cultural activity (i.e., human alteration of the natural landscape for purposes of occupation or extended use), although this evidence has been determined, either by a cultural resource survey or by a Commission site inspection, to be ineligible for Pinelands Designation (such sites may or may not require recording beyond the level of information submitted as part of the development application, depending on the ability of the site to contribute further to the ongoing cultural evolution of the region); and
- o other sites which are found to have insufficient remains because there is little or no physical remnant of an historic period occupation.

These evaluative criteria reflect similar procedures used by the state and federal governments to determine eligibility for the State and National Registers of Historic Places. Although decisions regarding eligibility for Pinelands Designation are based on analogous criteria, they are independent judgments made by the Commission and by Pinelands municipalities in an effort to protect the local and regional heritage. These decisions should not be construed as determinations of eligibility relative to the State or National Registers of Historic Places.

General Treatment Requirements

A. Background

The evaluation process provides the basis for assessing the significance of individual resources within the Pinelands, which is then used for judging what treatment procedure is appropriate at any given site.

There are three types of treatment measures available for all historic resources. Each of these is directed specifically toward preserving or recording those qualities which make the resource significant. The treatment alternatives, the choice of which is determined by circumstances outlined later (pp. 36-40), are:

- o Preservation in place, in which the resource remains in its original location and is protected from forces that would destroy the qualities that give it significance. This is the most desirable option and is required if the applicant can make a reasonable use of his property. The Secretary of the

Interior's Standards for Rehabilitation are used as the basis for treatment. They are applicable for preservation, restoration, and new construction at or adjacent to historic sites, as well as for rehabilitation.

Two publications from the United States Department of the Interior, National Park Service, are recommended for more specific guidance for interpreting The Secretary of the Interior's Standards for Historic Preservation Projects. They are The Secretary of the Interior's Standards for Historic Preservation Projects with Guidelines for Applying the Standards (1985) and Interpreting the Secretary of the Interior's Standards for Rehabilitation (undated). The latter is especially useful. It organizes projects by subject, discusses the preservation issue involved, references the applicable standard(s), and includes before and after photographs and plans. Although prepared for review of rehabilitation for certification under the Economic Recovery Tax Act of 1981, it includes a sufficient number of rural building types similar to those found in the Pinelands to be helpful in guiding decision makers dealing with preservation in place.

- ° Removal of the resource to a new location where it can be preserved. Since this destroys some of the qualities that make the resource significant, it will be used only when preservation in place is not appropriate. This option is available only for some types of buildings and engineering resources. Generally, if preservation at a new location is mandated, detailed recording (level I or II of The Secretary of the Interior's Guidelines for Architectural and Engineering Documentation) should be required. If the building is to be disassembled, detailed labeling of parts and appropriate storage prior to reassembly is necessary. The physical features of the new site and placement of the building on the site should match the original site and building placement as closely as possible, taking care to avoid destroying archaeological resources on the site to which the building is moved.
- ° Recording the resource to preserve, at least in archival form, some of the qualities or information that made the resource significant. This is a last resort and is used only when the resource cannot be preserved in place, cannot be moved to a new location and will be destroyed. Recording may also be used in conjunction with other treatments. The level of recording should be tailored specifically to each individual resource, although certain minimal requirements are specified in Section D.3 (p. 40) below. The amount of recordation for sites that are designated or designation eligible is different from that which is required for sites with sufficient remains. The former require a "certificate of appropriateness" before they can be altered or removed while the latter, because they are deemed less significant, are subject to a much simpler "recording" process.

B. Design Considerations for Development Projects

As previously mentioned, the most desirable treatment for all historic resources is preservation in place. The treatment requirements specified below in Section C represent minimum standards which will govern development proposals. These occasionally permit movement of certain resources to a new location and recordation of resources in certain other cases. Nevertheless, it is recommended that development applicants give serious consideration to the preservation in place of all identified resources in the early stages of project design.

This can be accomplished through a number of means, including designing construction projects to incorporate identified resources within protected open space and reusing buildings and other structures in a manner compatible with the overall development plans for a site.

In many cases, sensitivity to all potential historic resources in the early stages of project design will not only help to better preserve our cultural heritage but can also avoid lengthy time delays, project redesigns, and other costly measures that might be required in latter project stages.

C. Mandatory Treatment Requirements

This section provides the means whereby municipal officials can determine which of the three major treatment alternatives - preservation in place, preservation at another location or recordation - is appropriate at a project site. The process is intended to determine whether an applicant can adequately protect important cultural resources and still retain a reasonable use of his property. More specifically, the procedures seek to find out whether maintenance of a significant resource is compatible with a proposed development and, if not, whether redesign of the development to accommodate the resource is feasible. If the project cannot be designed to protect the resource, a determination must be made as to whether any reasonable use of the property remains.

The three treatment alternatives apply only to those sites which are formally designated or which have been determined to be significant resources. Sites which possess sufficient remains are only subject to a recordation requirement and do not have to be considered for preservation in place or at another location. No treatment measures are mandated for sites with insufficient remains.

1. Preservation in Place

Preservation in place is the required treatment if the qualities that make a resource significant can be maintained and protected - through measures such as avoidance, stabilization, restoration, rehabilitation, reuse or project redesign - in a manner that will still allow the owner a reasonable use of the property. Before moving a resource to another location or recording the attributes of the resource can be considered, a thorough evaluation of options to preserve the resource in place must be

considered. This evaluation relies, in large part, on the actions which can be taken to accomplish preservation in place and their feasibility but also considers the uniqueness of the resource under consideration.

Uniqueness of the Resource

It is recognized that every resource which is Pinelands designated or which is determined to be significant is important and should be preserved in place if possible. However, this presumption is given even greater weight if:

- ° The existing inventories clearly indicate that the resource is the last remaining example in the Pinelands that possesses the characteristics which contribute to its historic significance and meet the associated integrity standards.
- ° The existing inventories clearly indicate that the resource is the best remaining example in the Pinelands that possesses the characteristics which contribute to its historic significance and meet the associated integrity standards.

It is essential that resources which meet either one of these tests be preserved in place unless it is absolutely clear that the actions necessary to accomplish in situ preservation are infeasible.

Identifying Actions To Accomplish Preservation In Place

The feasibility of preserving a resource in place cannot be viewed in a vacuum. Before a feasibility assessment is undertaken, therefore, each potential option to achieve in place preservation must be thoroughly explored. A full range of options, the technical requirements involved, and an assessment of their anticipated benefits in achieving long term resource preservation must be documented. The following areas of inquiry should form the basis for this evaluation:

- ° What options exist to protect the location of the resource from disturbance and thus avoid any direct impacts? In this context, continuation of the present use must be considered.
- ° What options exist to preserve the resource through structural or archaeological stabilization or rehabilitation and do these actions lend themselves to an adaptive reuse of the resource? Conversion or adaptation of the resource to another permitted use as well as the possibility of a Pinelands waiver of strict compliance for adaptive reuse pursuant to N.J.A.C. 7:50-4.66(a)2.ii must be evaluated.
- ° What options exist to redesign the proposed project in a manner which avoids or lessens direct impacts on the resource? Options to reduce the number of proposed lots or cluster them in subdivisions, re-orient buildings and improvements in site plan application, and incorporate the resource in a project's design must be considered.

- Are these options feasible to accomplish from a technical preservation standpoint and from a technical design standpoint? At this stage of the evaluation, technical and not financial feasibility should be considered.
- To what extent will these technically feasible options protect those qualities which lend the resource its significance?

Other Feasibility Considerations

Each option which has been determined to be technically feasible and suitable in terms of protecting the resource's significant qualities must then be evaluated on the basis of other feasibility considerations. If no options were found to be technically feasible and suitable, there is no need to further consider in place preservation.

The general test against which these remaining options are evaluated is simply whether they are "feasible and practical." Costs, market circumstances, expectations, and other considerations must be taken into account in assessing whether any option is "capable of being carried out based upon experience or reasonable expectation as distinguished from speculation or abstraction." Each situation must be judged on its own merits; however, several areas of inquiry should be pursued. These include:

- How does the cost for repairing or outfitting a structure to meet zoning and construction code requirements compare to the cost of demolishing the structure and constructing a new structure or altering it in such a way that its significance is destroyed?
- How do the development costs of a redesigned project compare to the costs for the project as proposed?
- Can the owner or applicant earn a reasonable rate of return on the investment under any of the identified alternatives? If, of course, a property previously designated or found to be significant was purchased, investment backed expectations should not be considered. Rather, the following area of inquiry should be evaluated.
- Considering these cost comparisons, are market conditions such that an alternative use for the property or structure does not represent a practical and reasonable use for the property?

In order to thoroughly and objectively review these matters, it will be necessary to evaluate cost estimates for the project as proposed and for various alternatives. Other information concerning the property such as purchase price, date of purchase, assessed and market values, real estate taxes, annual debt service, gross income, annual cash flow, and bonafide attempts to lease or sell the property may also be necessary.

2. Preservation at Another Location

Should preservation in place not be possible, preservation at another location is then required if the resource is sufficiently well preserved that it can be moved to an appropriate location in a manner that will retain over the long term the qualities that make it significant and will allow the owner a reasonable use and return on his property. An appropriate location is one basically similar to the original site which occupies an environmental setting that complements the significant historic qualities of the resource.

All options which would allow preservation of a significant resource at another location must be carefully evaluated before recordation of the resource prior to demolition can be considered. Obviously, this alternative is only available for historic buildings and structures, since archaeological sites cannot be relocated.

As in the case with resources being considered for preservation in place, the uniqueness of the resource must be taken into account as well as the technical and economic feasibility of undertaking relocation. If a resource is the last remaining example of its kind in the Pinelands or the best remaining example of its kind, this will lend greater urgency to the consideration of its possible relocation. Such resources must be preserved at another location unless the actions necessary to accomplish this are infeasible.

Identifying Actions To Accomplish Preservation At Another Location

The relocation of historic structures can be a difficult procedure and, unless undertaken with care and forethought, can result in the destruction of the very characteristics which are intended for preservation. Both the technical feasibility of removing a structure and the overall impact and benefits of relocation with respect to the significant historic qualities must be fully evaluated. The following areas of inquiry should form the basis for this evaluation:

- ° Is the resource sufficiently well preserved that it can be relocated while still retaining its significant characteristics? In this regard, the structural integrity of the resource must be considered and the historically significant elements must be clearly identified.
- ° Does the relocation site complement and contribute to the continued preservation of the significant characteristics of the resource? For the most part, the relocation site should be similar to the original location in appearance, particularly from the period when the resource gained its significance.

Other Feasibility Considerations

If the technical feasibility of relocating a significant resource has been established and the relocation will contribute to its preservation, the practicality of the action must also be considered. As is the case with preservation in place, market factors must be taken into account if the true feasibility of relocating a structure is to be

adequately assessed. Each situation must be judged individually but several general areas of inquiry should be addressed, including:

- ° How does the cost for relocating and outfitting a structure to meet construction code requirements compare to the costs of demolishing the structure and any new construction required for the applicant's proposed use?
- ° Can the owner or applicant earn a reasonable rate of return on the investment, given the possible return on both the original site and the relocated site?

If a property previously designated or found to be significant was purchased, investment backed expectations should not be considered. Other information concerning the property such as purchase price, date of purchase, assessed market values, real estate taxes, annual debt service gross income, annual cash flow, and bonafide attempts to lease or sell the property may also be necessary.

3. Recordation

a) Pinelands Designated sites and significant resources

Resources which cannot be preserved, either in place or at another location, must be recorded according to the standards contained in Section D. below, unless one or both of the following exceptions apply:

- The qualities that make the resource significant cannot be recorded beyond the level achieved during the initial cultural resource survey; or
- The recorded information will not increase knowledge about the identified research questions for this resource group.

The recording must be accomplished according to a research design developed by a qualified consultant and approved by the Pinelands Commission prior to the start of data recovery operations. The research design and recordation process must specifically address the qualities that contribute to the resource's significance, including, where applicable, the research priorities identified in each of the resource group subchapters.

b) Sites with sufficient remains

These sites must be documented. If additional documentation of the resource will provide information regarding Pinelands culture beyond that which has been acquired pursuant to the development application, the site should be recorded according to the standards specified in Section D. below. If not, no further recording is required.

D. Standards for Carrying Out Treatment Requirements

The following standards must be employed when undertaking one of the three required treatment measures.

Preservation in Place

For resources that are judged eligible for preservation in place, a certificate of appropriateness must be obtained pursuant to N.J.A.C. 7:50-6.156. The certificate should specify that the resource will be preserved in place according to the following provisions recommended below (see also Chapter III):

a) Buildings, structures, architectural features, and engineering features.

(1) Deed covenants, easements, or other appropriate mechanisms must be developed to provide that: any rehabilitation of the resource must be performed in accordance with the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67); and the resource must be protected sufficiently to preserve those qualities that make it significant.

(2) Before beginning rehabilitation, the original condition of the resource must be documented photographically in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation.

b) Archaeological sites.

(1) A deed covenant, easement, or other appropriate mechanism must be developed to provide for protection, through restricted access if necessary, to preserve those qualities that make the resource important. Any on-site activities must have no detrimental effect on the preservation of the resource. The covenant or other appropriate mechanism must further direct that any stabilization of the resource will be carried out in conformance with the Secretary of the Interior's Standards for Historic Preservation Projects.

(2) The archaeological resource should be incorporated into open space whenever project designs or land use activities permit.

(3) Land allocated for resource preservation may need to be set aside for that single use if the preservation of the resource is not compatible with other activities.

2. Preservation at Another Location

For resources that are judged eligible for preservation at another location, a certificate of appropriateness must be obtained pursuant to N.J.A.C. 7:50-6.156. The certificate should specify that the resource will be preserved at another location according to the provisions recommended below (see also Chapter III):

- a) Deed covenants, easements, or other appropriate mechanisms must be developed to provide that: any rehabilitation of a resource must be performed in accordance with the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67); and the resource must be protected and maintained sufficiently to preserve those qualities that make it important.
- b) The relocation of the resource must be designed to minimize the damage to the resource and to preserve those qualities that make it important. The relocation should be undertaken in accordance with the Secretary of the Interior's publication, "Moving Historic Buildings."
- c) The resource should be recorded to the requirements of the Secretary of the Interior's Standards for Architectural and Engineering Documentation prior to removal from its original location. Minimally this will include the preparation of a site plan, appropriate photographs and/or drawings, and a narrative description of any historical functions or processes carried out at the site.

It is also recommended that interpretation of the resource for the education and edification of the public also be considered if, indeed, the resource lends itself to such a use.

Recordation

Because of special conditions that apply only to resources within specific resource groups, there are in most instances specialized recordation requirements for individual sites. The "Special Evaluation and Recording Requirements" section at the end of each resource group sub-chapter should be consulted to determine if any additional measures are necessary.

- a) Pinelands Designated sites and significant resources:

For resources that are judged eligible for recordation, a certificate of appropriateness must be obtained pursuant to N.J.A.C. 7:50-6.156. The certificate shall specify that the resource will be recorded according to the following standards:

- (1) Recording requirements for resources with research potential
 - Historical research, including oral historical when appropriate, sufficient to address the

research topics to which the site can contribute information. This documentation must be produced in accordance with the Secretary of the Interior's Standards for Historical Documentation.

- When structures, features and equipment exist, appropriate drawings and/or photographs and written descriptions that document all such resources must be prepared. This documentation must be produced in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation.
 - Sufficient archaeological excavation must be conducted to address the identified research priorities relating to social, functional, technological and economic elements of the site that are present but cannot be studied in any other way. Archaeological work will be conducted in accordance with the Secretary of the Interior's Standards for Archaeological Documentation.
 - A final report must be prepared that synthesizes the information acquired through research and excavation and presents the information in a form that meets the appropriate requirements of the Secretary of the Interior's Standards for Architectural and Engineering Documentation, the Secretary's Standards for Archaeological Documentation and the Secretary's Standards for Historical Documentation.
- (2) Recording requirements for resources associated with events significant in local, regional, state or national history
- Historical research must be conducted which is sufficient to place the resource in its cultural context and define how it is associated with a significant event in the broad patterns of history. This documentation must be produced in accordance with the Secretary of the Interior's Standards for Historical Documentation.
 - A site plan in correct scale must be prepared that shows the relationship of all components of the site.
 - Appropriate drawings and/or photographs and written descriptions that document all aspects of the resource and any related features,

resources or processes must be prepared. This documentation must be produced in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation.

- Sufficient archaeological excavation must be conducted to examine aspects of the resource that cannot be studied in any other way. Archaeological work will be conducted in accordance with the Secretary of the Interior's Standards for Archaeological Documentation.
- A final report must be prepared that synthesizes the information acquired through research and excavation and presents the information in a form that meets the requirements of the Secretary of the Interior's Standards for Architectural and Engineering Documentation, the Secretary's Standards for Archaeological Documentation and the Secretary's Standards for Historical Documentation.

(3) Recording requirements for resources associated with persons significant in local, regional, state or national history

- Historical research must be conducted sufficient to establish accurately the precise relationship of the individual to the resource and to separate historical fact from unsubstantiated assertions. This documentation must be produced in accordance with the Secretary of the Interior's Standards for Historical Documentation.
- A site plan in correct scale must be prepared that shows all the features that comprised the resource during its period of association with a significant individual.
- Appropriate drawings and or photographs that document all aspects of the resource from its period of association with a significant individual. This documentation must be prepared in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation.
- Sufficient archaeological excavation and/or other physical examination must be conducted to determine the nature and condition of the physical remnant of the resource which is

extant from its period of association with the significant individual. Archaeological work will be conducted in accordance with the Secretary of the Interior's Standards for Archaeological Documentation.

- A final report must be prepared that synthesizes the information acquired through research and excavation and presents the information in a form that meets the requirements of the Secretary of the Interior's Standards for Architectural and Engineering Documentation, the Secretary's Standards for Archaeological Documentation and the Secretary's Standards for Historical Documentation.
- (4) Recording requirements for significant architectural or engineering resources
- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is:
 - ° a rare example of a building tradition or style in the Pinelands with its important physical features well preserved,
 - ° an unusual design or an unusual adaptation of a typical design for the Pinelands with its important physical features well preserved,
 - ° a reflection of ethnic or socio-economic conditions in the Pinelands, or
 - ° a rare representation of the work of a master craftsman with its important physical features well preserved.

Photographic documentation must include: the structure in context, all elevations, exterior details, typical interior spaces, and interior details. Minimum graphic documentation must include an 8½" x 11" sketch plan with overall dimensions of the structure or an 8½" x 11" schematic drawing of a function or process.

In addition, measured drawings will be required if the resource is exceptionally well preserved and contains details about method of

construction, style or technological developments that cannot be adequately recorded through photographic documentation. This would include all floor plans, sections, elevations, architectural and construction details, and a site plan.

- Photographic documentation sufficient to record the exterior appearance of all buildings, structures and engineering resources; minimal graphic documentation, including a site plan depicting in correct scale the location of all buildings, structures and engineering resources; and either an Architectural Data Form for a building or a short narrative discussion of any process or technology that is represented will be required if the resource is:
 - ° a typical example of a building tradition or style in the Pinelands,
 - ° a rare example of a building tradition or style in the Pinelands whose important physical features are poorly preserved,
 - ° identical to other resources that have been previously recorded,
 - ° an unusual design or an unusual adaptation of a typical design for the Pinelands whose important physical features are poorly preserved,
 - ° a rare representation of the work of a master craftsman whose important physical features are poorly preserved.

- All recording efforts will be conducted and documentation produced in accordance with the Secretary of the Interior's Standards for Architectural and Engineering Documentation.

b) Sites with sufficient remains:

These resources should be documented according to the following standards:

- (1) Sufficient photographic documentation to record the exterior appearance of all buildings, structures and engineering resources.

- (2) A site plan depicting in correct scale the location of all buildings, structures and engineering resources.
- (3) A New Jersey State Inventory form for a building or a short narrative discussion of any process or technology represented at the site if these will contribute to the documentation of the resource beyond the photographic record.
- (4) A narrative description of the resource and its cultural environment.

AGRICULTURAL SITES AND GRISTMILLS

General Description

This resource group comprises row crop and truck farms, located primarily along the northern and western perimeter of the Pinelands, the mostly vanished poultry farms of Atlantic and Cape May Counties and berry agriculture (cranberry and blueberry) practiced in the interior. Row crop farming occurs well beyond the limits of the Pinelands, extending west across the Delaware Valley and north into central Jersey. In contrast, berry farming, which is suitable only under precise soil and hydrologic conditions, is limited to the Outer Coastal Plain.

The time period which this resource group encompasses begins in the latter 17th century when the narrow, fertile strip between the Delaware River and the Pine Barrens was cleared for crops. Berry farming did not develop until more toward the mid 19th century. Both activities have continued, though somewhat diminished in their total acreage, until the present day.

Specific information relating to historic agriculture is relatively scant. Data concerning the material remnant of this resource group is particularly scarce. The primary sources are the Pinelands historic sites inventory, a survey of Inner Coastal Plains farms prepared at the behest of the Office of New Jersey Heritage (ONJH) and the Whitesbog cultural resource survey, which was commissioned by the New Jersey Conservation Foundation. The Pinelands inventory contains a list of historic farmsteads derived from historic maps, local histories and other documentary materials. The list is intended to be representative, not comprehensive, and includes little physical description. Each heading in the inventory is keyed to U.S.G.S. 15' quadrangle maps to provide general locational data. Individual structures are only rarely enumerated and property types are nowhere discussed. The present condition of sites is sometimes briefly mentioned in passing.

The ONJH survey identifies farmstead types, common physical plans and general patterns, with specific examples of each type. A total of fifty-one 18th and 19th century farmsteads on New Jersey's Inner Coastal Plain are included, of which only a small number at most would have been in the Pinelands (exact locations are not provided). The inventory is derived solely from files and related materials in ONJH and thus is not a comprehensive listing of all historic farm sites. Special attention is paid to the twenty-eight farm complexes which had been mapped. Some limited information is provided about architectural style, but this mainly relates to barn types as a function of ethnicity. Property types listed include the farmhouse, barn, tenant houses and outbuildings (silos, cribs, sheds, etc.). The orientation and organization of farm buildings in a complex are discussed as they relate to the evolution of crops and agricultural technology. Typical farm plans, and changes to them over time, are identified and described.

The Whitesbog survey (Historic Architectural Survey and Preservation Planning Project: Village of Whitesbog 1982 - also available through ONJH) is a detailed physical description of the

evolution of a highly significant berry agricultural station and settlement. Most of the physical features commonly associated with this farm type are found at Whitesbog and this study is used as a model by which the physical remnant and plan of berry farms may be anticipated. The report uses historical documentation and oral history to detail the physical, social and technological evolution of the site. An inventory of the bogs and buildings at Whitesbog is included, with photographs of all the structures.

The quantity of the existing information does not accurately reflect the true incidence of agricultural site occurrence in the Pinelands. The ONJH survey does not distinguish Pine Barrens sites from those elsewhere in the Inner Coastal Plain and the Pinelands Commission inventory often refers to "agricultural areas" without enumerating individual sites. An approximation of the number of farmsteads and extant property types in the Pinelands is not possible with the present data.

Agriculture in the Pinelands represents an activity of high significance and cultural impact. Its continuing economic impact reflects an historic pattern that has existed for centuries. Today New Jersey is second and third in the nation in the production of blueberries and cranberries respectively. Its influences on land use patterns, particularly in the Inner Coastal Plain, and settlement patterns throughout the Pinelands, are still easily discernible. Most of the area west and north of the Pines is yet dominated by row crop and truck farming; it is an economic staple of the region. Many of the settlements here owe their location and early existence to agriculture, having started as marketing and processing centers for the outlying farms. The evolution of crop types, labor and marketing in row crop and truck farming provides a good case study for the response of agriculture to an increasingly urbanized industrial society. Berry agriculture, with its labor intensive practices of the 19th and early 20th centuries, also evolved specific socio-economic conventions that are sometime reflected in the farm layout. These have implications for a study of ethnicity in the region.

Historical Summary

At the time of the Revolutionary War and for a long while thereafter, the United States was a rural agrarian society. Attempts at establishing manufacturing centers had been suppressed during the colonial period and were only beginning to take shape in the early 1800s. It was not until the latter 19th and early 20th centuries, with the great influx of immigrants and shifts in the native population, that this country became a truly industrialized society. Northern New Jersey was thoroughly swept up in this transformation but south Jersey, traditionally less densely settled, retained its agricultural heritage. The industries that did settle in the region were rural in character and layout, remaining always manufacturing sites rather than manufacturing centers. The tendency to cluster and concentrate various manufacturing operations for more efficient use of resources and facilities is one of the hallmarks of true industrialization. This simply never occurred in

the Pinelands where mills were typically viewed as isolated and unrelated ventures, much like a general store. The qualities of organization and centralization that helped turn industry into industrialization never took root here.

Throughout south Jersey's history, agriculture has accounted for a major portion of the region's land use patterning. For this reason alone, as well as for others, it must be considered a major determinant of culture. As farming determined what much of the land would be used for, so the land itself determined what kind of farming would be practiced there. Two principal kinds of agriculture have been pursued in the Pinelands, row crop/truck and berry. Row crop and truck farming began at least a century earlier in the region than berry agriculture, in response to the immediate need for food for a burgeoning population. These farms were already well established in the area by ca. 1700, having spread east from the narrow, fertile, more intensively settled strip of Inner Coastal Plain along the Delaware River. After the English had wrested control of New Jersey from the Dutch in 1664, the population increased dramatically throughout the colony and the number of these farms grew accordingly. Then as now, they have occupied an area forming an arc around the western and northern fringes of the Pines, avoiding the sandy soils characteristic of much of the Outer Coastal Plain.

By the close of the 17th century, the entire Inner Coastal Plain and the more suitable areas of the Pinelands were dotted with small independent farms of 100-300 acres. Tenant farming at this time was rare. The scant evidence that remains of these early farmsteads indicates that there was far more variation in layout and architecture than in later years. In 1700, farms were intended to be self-sufficient and thus produced a greater variety of foodstuffs, though each in smaller quantities. Siting requirements at the time also differed from later periods. With the lack of a good road system, location near a navigable stream was preferred so that the crop surplus could be brought to market. Many of the streams were harnessed for saw and gristmill operations, a common sideline of 17th century farming. The early farms also most strongly reflected the ethnic heritage of their owners. Distinctive architectural styles, particularly in barn construction, reflecting English, Dutch and Swiss-German traditions, were readily apparent. Dutch style barns tended to be square with a steeply pitched roof and wide doors beneath the gable ends. English barns were elongated three bay oblongs with a more gently pitched roof and doors on the long sides. The Pennsylvania barn, probably derived from Swiss-German types, was a full two stories and had a cantilevered facade. The English style predominated along the western edges of the Pines, in what was then West Jersey, an area where English Quakers and settlers from New England were in the majority.

Farm practices and appearance continued without a great deal of change throughout most of the 18th century. Cultural distinctions in architecture remained, though they gradually began to erode as a more homogenized American vernacular form arose. The layout of farm buildings, which was always more related to function than ethnicity, assumed the classic courtyard form which allowed for ease of access in an

economy of space. With the choice locations near navigable waterways exhausted, milling operations ceased to be a function of new farms of the 18th century. Greater emphasis was being placed on profitability and the sale of crops to market, so better road systems slowly evolved. With a stable economy and an expanding population, a general prosperity reigned into the 1770s. Toward the end of the century, however, the economic effects of the American Revolution and lowered yields resulting from soil depletion combined to cause a depression and widespread abandonment of farms.

Agriculture did not really rebound in south Jersey until the 1830s and soon thereafter underwent profound changes that transformed the practices of 19th century farming. Crop yields increased dramatically with the introduction of marl as a fertilizer. Crop rotation and other improved management methods further increased productivity. Ironically, though, it was the Industrial Revolution that had the greatest effect on farm crops and procedures. Urbanization brought a greater demand for food, and advances in farm equipment technology helped meet that demand. Competition from the mills for an ever scarcer labor pool forced farmers to adopt less labor intensive methods of planting and harvesting. But the greatest changes in this period were not in the amount of food, but the types of food produced. The proximity of major markets and the improving road system had already begun to make truck farming more attractive by the early 1800s. When midwestern farmers began to compete successfully in the grain and livestock trade, the conversion to specialized farming in perishable foods and dairy accelerated.

Despite this competition, many farms continued to grow feed and grain crops and the need for gristmills in South Jersey persisted. Grist grinding had started in New Jersey even prior to the coming of Europeans. The Indians did their grinding by hand, as did the early Dutch arrivals who established a few widely scattered settlements by the 1660s. More complex, but still basically hand-operated, systems were adopted during this period. However, it was not until after the English seized New Jersey in 1664 that larger, water powered grist mills were employed. They flourished as agriculture expanded and continued in operation well into the 20th century. Eventually more reliable steam engines supplanted the water wheels as the predominant source of power. In some places, the mills were built by community subsidies which provided building materials, land or even a wage for the miller. Thus they were often a cooperative venture, binding people together economically and socially.

Consolidation of agricultural processing for the sake of efficiency, however, eventually caused the gradual elimination of the local mills. Today, the water powered grist mill at Batsto is the only such one still in operation, and this, of course, is basically for the benefit of visitors.

At the close of the 19th century, row crop farming in southern New Jersey was a vastly different operation from what it had been a century earlier. The self sufficient farmer who produced a little of everything had become a specialist tied as closely to the market economy as any other businessman. The physical appearance of farmsteads also underwent

marked changes. Specialization had its effect on farm layout and architecture, but other factors were significant too. The decrease in labor intensive work obviated the need for seasonal housing. Agricultural manuals with model farm buildings encouraged a uniformity of style. Finally, through attrition and addition the distinctive old ethnic styles gradually disappeared, blending into the vernacular American tradition that is still so recognizable today.

One specialized type of operation, the poultry farm, enjoyed a brief period of success in the late 19th and early 20th centuries. Founded largely by Eastern European Jews fleeing religious persecution, these farms became quite common in portions of Ocean County and south of the Mullica River, though they have mostly disappeared in the years since World War II. Their remains are easily recognizable by the presence of long wooden or masonry chicken coops.

Berry farming in the Pinelands has had a very different history. The American cranberry and the blueberry grow readily in the swampy, acidic soils characteristic of the heart of the Pine Barrens. Both are indigenous to the region and have been part of the natural harvest cycle since prehistoric times. Not surprisingly, the Indians gathered blueberries in great abundance in mid-summer, according to early chroniclers. They also gathered wild cranberries in autumn which became an important part of their winter diet.

Even before any attempts were made to cultivate the wild cranberry, it was recognized as a potentially valuable crop. A law passed in New Jersey in 1789 forbade the taking of the fruit from any lands without compensation to the owner. Controlled cultivation of cranberries began in the 1830s at bogs established near Burrs Mill. By the 1840s, John Webb in Cassville and William Braddock in Shamong had also built bogs and were harvesting crops. Starting about mid-century, more and more land was cleared for cranberry bogs as demand both at home and abroad increased. The major requirements for successful cranberry cultivation, a plentiful water supply and mucky soils composed of organic materials and alluvium, were recognized and exploited early. Improvements in the methods of growing and harvesting have occurred both by chance and design ever since. In 1882 Joseph J. White, of Whitesbog fame, in attempting to kill off an insect infestation, discovered that flooding the bogs for a period in mid-summer stimulated plant growth. Around this time growers also learned that flooding the bogs in winter helped shelter the vines from the elements.

White himself proved to be a pioneer in the field of cranberry horticulture, as was his daughter years later in domesticating blueberries. His manual on the subject, published in 1871, provided instructions on the proper method of building a bog as well as on growing and harvesting the fruit. Construction was begun by clearing a swampy area of its surface vegetation and exposing the underlying muck, which was then covered with a layer of sand. A network of irrigation/drainage ditches was cut through the cleared area, with a main channel down the center of the bog and smaller ones crossing it at regular intervals. A dam of sand, covered with the turf that had been removed from the bog surface, was built around the entire perimeter, with flood gates placed

to allow movement of water to succeeding bogs in the system. With the bog thus constructed, cranberry vines were planted in small holes arranged in a grid pattern across the entire surface.

After White's death in 1924, improvements in all phases of cranberry production from planting to packing gradually increased the yield while cutting the farmers' costs significantly. In the 1940s, new methods of planting the vines reduced the time it took for a bog to come into production from about seven years to three. White's cranberry sorting device, invented about the turn of the century, saved both time and labor in what had been an arduous process. Newer and more reliable machines invented some years later further simplified the procedures.

Methods of harvesting have been revolutionized in recent decades. At the turn of the century, 500 to 600 hand pickers, mostly Italian immigrants from Philadelphia, were required for the Whitesbog harvest. This number was reduced by up to 75% with the introduction of cranberry scoops around 1930. Later, the invention of a cranberry picking machine eliminated the need for 90% of the remaining workers. Finally, in 1965, wet harvesting was introduced and quickly became the accepted practice. In a wet harvest, the bog is flooded and the berries, freed from the vines by agitating machines, float to the surface. They are herded to one corner of the bog by float lines where a bucket conveyor lifts them into bins. The entire harvesting operation can now be accomplished with only a few workers, a job which took several hundred seventy years ago.

The cultivation of blueberries began early in this century as an outgrowth of research into cranberry culture. Both the high bush and low bush varieties of blueberry grow wild throughout the Pine Barrens. Gathering of the ripe berries in mid-summer has long been a part of the local culture, but the plant had resisted repeated efforts at cultivation. Then in 1911, Elizabeth White, the eldest daughter of Joseph White, and biologist Frederick Coville began efforts to propagate a commercially viable blueberry crop. Local residents gathered wild bushes, chosen for the size of their fruit, and brought them to Whitesbog where cuttings from them were re-planted. After five years of experiment, the first sale crop was produced in 1916. Further testing of hybrid species resulted in the development of several superior varieties that were later exported to other states. The blueberry industry has been a staple of the Pinelands economy ever since.

Elements of an Agricultural Site

Since the siting requirements and farming methods of row crop and truck farming vs. berry agriculture are so different, it is not surprising that their physical remnant is also quite different.

The row crop/truck farm has evolved slowly since the 17th century, mostly as a result of the specialization of farms in the 19th century. The rise of the "gentleman farmer" at that time also affected the plan of a small but significant number of farmsteads, which were laid out to reflect more a pastoral ideal than any functional necessity. In general, it can be said that the earlier farms, those of the 1600s and 1700s,

are more closely tied to the natural environment and to the ethnic heritage of their owners. Cultural factors, such as orientation toward a road or modification of farm buildings to adjust to market factors, are far more evident in the 19th century.

From an early date a majority of row crop/truck farms had assumed the traditional courtyard plan, with the major buildings grouped in a fairly predictable pattern. More rarely, structures were arranged in a linear fashion, in some cases to take advantage of an on-road location. Barns were almost always behind or to the side of farmhouses and both usually faced south to capture the winter sun. Workers' housing, where it occurs, was more randomly placed. Other outbuildings included carriage houses, silos, sheds, corncribs and, increasingly in the 19th century, specialized storage structures related to the single product of the farm. Many of the very early farms also included a sawmill or gristmill if there was a suitable water power source. Rarely, if ever, were any of these buildings joined, a hedge against the danger of fire.

The overwhelming majority of south Jersey farm buildings were made of wood, the cheapest, most readily available and easiest material to work with. Stone and brick barns and farmhouses occur only infrequently. Because of this, and because structures often underwent modification and expansion, unaltered examples of pre-19th century farm buildings are almost non-existent.

For row crop farms at least fifty years of age, the following components are likely to be found:

Farmhouses - Traditional and vernacular house types identified in the subchapter on Residential Architecture will be found as farmhouses. They are likely to be frame structures except along the western fringes of Burlington County where brick is common. If the farm has remained in operation, the physical condition is likely to be good, but the house may be altered.

Barns - Barns in the Pinelands are probably primarily gable roofed buildings from the nineteenth or twentieth centuries. Because of the predominance of row crop farming as opposed to dairying or other livestock oriented farming, many barns in the Pinelands are probably smaller and more used for storage than in other farming areas of the state. It is possible that English barns from the late eighteenth or first half of the nineteenth century remain standing in the Pinelands. These would likely be found in the western parts of the Pinelands, particularly western Burlington County.

Worker's Housing - Worker's or tenant housing does not appear to be common on Pinelands farmsteads. Where it does exist, it is generally a small, traditional wood house of its period.

Outbuildings - Sheds, coops, corn cribs, wagon houses and carriage houses are typical farmstead outbuildings. Domestic outbuildings may include smoke houses, well houses, ice houses and privies. All these

provide information about production and living standards. Most are probably frame with a modest foundation or none at all. Domestic outbuildings, especially privies and well houses, are likely to be close to the farmhouse; privies probably also served as trash dumps.

The physical elements of a gristmill site are, in most cases, simple and straightforward. They include the mill with its associated machinery, the water power system, and the miller's house and grounds. The individual components at any particular milling site would vary according to several factors, such as the type of water wheel that was used and the presence of any other operations on the site. Specific features at a grist mill site were:

- Water wheel - The types of wheels that were used included overshot, breast, and undershot wheels, which were all vertically mounted wheels, and turbines (a horizontal wheel enclosed in a housing). An overshot and a breast wheel both worked by means of water falling on to blades or buckets and thus generally required a dammed millpond and a raceway (a water trough or canal) to channel water from the pond to a point above the buckets. An undershot wheel was a broad paddle wheel over a stream; it operated by the action of the passing stream striking the rotating wheel blades. A turbine is a small, enclosed, highly efficient wheel mounted horizontally; water was channeled by the use of curved blades on to the wheel blades. Turbines required some sort of flume or raceway to direct water into the wheel housing.
- Mill dam or weir - with a millpond; required if an overshot or breast wheel or a turbine was in use.
- Raceway - a channel or sluiceway to carry water to an overshot or breast wheel or a turbine. Equipped with a floodgate at its head and probably trashracks to prevent floating debris from damaging the wheel.
- Gristmill - a 2½ - 3 story, squarish building, either stone or frame, housing the grinding stones, the cleaning and bolting machinery, and the interior wheels, gears, shafting, belts, elevators, conveyors, etc. of the milling process as well as storage area for the finished grain.
- Miller's residence - probably a frame house with a privy and a barn nearby.

Although not integral to the functioning of gristmills, sawmills were very often found in association with them. Perhaps because grist grinding was by nature seasonal, the miller supplemented his income with sawyering.

Berry farms on a commercial scale in the Pinelands interior started much later, ca. 1850, and were specialized farms from their inception. Thus, their physical plant has been less subject to change than row crop/truck farms. In recent decades though, major changes have been visited upon cranberry operations relating to bog layout, harvesting and

sorting. All three reflect changes in the technology and economics of the cranberry industry. Bog layouts have been greatly affected by the introduction of the wet harvest method in the 1960s. Bogs built since that time are far more regular in plan and the beds more level, requiring less water for the harvest. Wet harvesting also eliminated the need for great numbers of workers to gather the berries. Without seasonal workers, the need for whole villages to house them also passed. Many of the sorting and packing houses have disappeared along with the workers' housing. Except for cleaning and rough sorting, these operations are mostly done now at processing plants. Only the dry harvesters who sell their fruit fresh for market continue to do all their own sorting and packing.

In 1900, the village of Whitesbog was the largest cranberry operation in the state. Today it is the best preserved and its remnant is an invaluable relic of a still highly significant Pinelands economic activity. The site also serves as a fine example of a 19th - 20th century agricultural community with all the components that would be expected of that era. The complex includes a series of dwellings for managerial people, permanent and semi-permanent employees, and seasonal workers. These dwellings range from single family houses and bungalows, to a boarding house, duplexes and, formerly, larger multi-family housing in the seasonal workers' villages of Rome and Florence (no longer extant). One of the houses in Whitesbog doubled as a school building for the children of year-around employees. The needs of the residents were also served by a general store, a water tower and filter house, a greenhouse and various structures for livestock. Buildings related to the cranberry business included the massive sorting and packing house and its associated power house and sheds, the barrel factory and barrel warehouse and other scattered garages and sheds. Virtually all of the buildings in Whitesbog and its satellite sites of Rome and Florence were of wood with brick or concrete foundations.

In sum, for purposes of identification and research the property types associated with agricultural sites of the Pinelands include:

Row crop farms

- farmhouse
- barn
- workers' housing
- outbuildings

Gristmills

- dam/weir
- raceway
- mill/millwheel
- residence

Berry farms

- farmhouse
- workers' housing
- school
- general store
- outbuildings
- cranberry bogs
- water control mechanisms
- sorting/packing house
- cooperage

Present Status

Row crop/truck and berry farms were and are a thriving industry in the Pinelands. Their existence is not threatened, but the historic fabric of many of them is. Ironically, it is their very success which poses much of the danger to these sites. Their most significant historical components are subject to alteration or demolition because of expansion, changing use patterns, new technologies, or obsolescence. For the cranberry farms, a further problem is that not all the associated structures are necessarily found at the farmsteads. Barrel factories, packing houses and warehouses which served smaller growers can be found in town centers.

Because a large portion of the agricultural sites of the Pinelands has remained in constant use, the general state of preservation of this resource group is reasonably good. However, their historic plan and appearance have often been obscured by additions to the old buildings and by the erection of new ones. Many of these changes are reversible though and, in any event, represent the natural evolution of a still dynamic economic and cultural activity.

The most valuable farmsteads for historic preservation purposes are those which exhibit the greatest number of intact buildings of the greatest antiquity. Physical evidence of 17th and early 18th century row crop farm practices is particularly meager and is the most significant. In fact, any agriculture related remnant that pre-dates the general depression and abandonment of the late 18th century is rare and worthy of special attention. Farms which were occupied for an extended period and retain evidence of an evolution in economics or technology are also very significant.

For row crop/truck farms of historic merit, the anticipated state of preservation of the major components is as follows:

Farmhouses

The majority are of wood, though some are brick; foundations are rubble masonry or brick. If a farm has remained in operation, the house would probably be well maintained, but perhaps substantially altered. Privies for the farmhouses, which are likely to have served as trash dumps and are therefore valuable archaeologically, should be in fairly close proximity.

Barns

Foundations are of rubble masonry with a frame structure, or more rarely brick. On working farms, barns are subject to considerable alteration or replacement.

Workers' Housing

Workers' houses occur only infrequently on row crop farms and are almost always frame buildings on a modest rubble masonry foundation. The superstructures of most have been reasonably well maintained.

Outbuildings

Sheds, coops, smoke houses, ice houses, corn cribs, garages, etc., are the normal complement in a farmstead and provide information about production and living standards. Most are frame with a modest foundation or none at all and are clustered around a courtyard.

The total number of known gristmills at one time or another within the Pinelands is approximately thirty-nine, according to the various sources available. This number is most probably only a low estimate. Conceivably, since gristmills were not very large scale operations and not well documented, many of the smaller private ones have simply disappeared without record.

Gristmill sites were scattered through much of the western Pinelands. They sprang up wherever there were both a water source and sufficient need for them. The only resemblance to concentrations of mills is to be found on the Mullica, Rancocas, and Tuckahoe River systems. For the most part, these sites are in a poor state of preservation and are valuable principally as archaeological entities, with the most likely remains being the foundation of the mill and portions of the mill dam. The generally anticipated state of preservation for various components of a gristmill site is as follows:

-dam or weir - built of earth and stone; good chance of it being partially intact.

-raceway - if it were entirely or partially a channel cut through the terrain, it should be discernible. Traces of the headgates and the trashracks may remain.

-water wheel - if built of wood, it would not survive, though metal sheathing, reinforcing and bolts would. Later wheels often were iron, but may have been removed for scrap. Turbines (popular after 1850) were always metal and installed well down in old wheel-pits; may be intact, if not hauled away for scrap.

-gristmill - foundations should be in evidence. Water wheel pit (for overshot and breast wheels) would be within the mill or directly adjacent to it. Most of the interior equipment was of wood to avoid sparks that could ignite grain dust; thus little would survive. Grinding stones may still be present.

-miller's residence - foundations should be intact, as well as privy and foundations for any outbuildings.

Newer technologies and marketing changes have eliminated the need for many of the traditional cranberry related structures, including seasonal housing and most of the sorting and packing houses and cooperages. Some have consequently disappeared and others have been converted for different uses. No systematic survey of the material culture of berry farms of the Pinelands has ever been undertaken. Such a survey would be complicated in any event by the fact that many of the significant structures are not found at the farm sites. Unfortunately,

at the present time too little is known to even attempt to assess their present status.

Research Priorities

The major research questions relating to the history of Pine Barrens agriculture deal with farm processes only insofar as they reflect a response to the changing market economy or other aspects of regional culture. Agriculture is a sensitive barometer of the nature and density of area settlement, as well as of general population trends, ethnicity and economics. The topics of interest for preservation purposes have to do with the relationship of food production to the natural and cultural environment, with a special emphasis on the early periods which are so poorly documented. Any physical evidence which would shed light on farming patterns and practices of the latter 17th and early 18th centuries would be particularly significant. This would include any remnant of milling activities and the materials being milled at individual sites.

Patterns of food distribution and features relating to food distribution systems are integral to an understanding of the development of south Jersey agriculture. Their study would provide information that would contribute to an analysis of the 18th and 19th century regional economy. Further evidence could be provided by careful investigation of food storage facilities, both on and off farm sites, in order to determine the sequence and amounts of foodstuffs being produced over time.

Another major question for research would address the effects of farming on the natural environment. Did the documented soil depletion of the 18th century leave a permanent trace? More importantly, the use of fertilizers since the first half of the 19th century may have caused an alteration in the quality of the groundwater and in the biota of the Pinelands. This should be explored, as should the clearing of large land areas for the introduction of row crop/truck and berry agriculture. This would have created new habitat conditions for both flora and fauna of the Pinelands. The degree to which these conditions have affected the natural ecology, certainly well beyond the strict boundaries of the farmsites, is one of the major topics to be explored in any study of the influences of the culturally controlled environment.

To aid in resolving this research agenda, it would be particularly useful to concentrate attention on farmsteads when conducting comprehensive municipal inventory surveys in suburbanizing areas. Researchers should incorporate data on all buildings, structures, and historic landscape features; describe and analyze farmstead siting, farm size and layout; and trace the evolution of agricultural practices for the survey area as a whole as well as for individual farmsteads. The survey should also record data on continued use of historic barns and outbuildings, particularly in Agricultural Production Areas and Special Agricultural Production Areas where information on successful continued use of farmsteads could prove to be a valuable tool for preservation.

Some of the more specific questions relating to broad themes of research into agricultural history include:

Farm Plan and Spatial Relationships

1. What are the siting requirements for row crop/truck farms and berry farms? To address this question, information on the following topics must be collected:
 - a. Environmental criteria
 - 1) proximity to water source
 - 2) soil types
 - b. Economic criteria
 - 1) proximity to transportation
 - 2) market demand and location
 - c. Relationship to crop type
2. What are the farm's physical plan and functional arrangement? To address this question, information on the following topics must be collected:
 - a. Acreage of farm
 - 1) relationship to crop and yield
 - 2) location of buildings within the farm; functional relationship to growing areas and crop
 - b. Layout and spatial relationship of buildings
 - 1) relationship to farm functions
 - 2) relationship to cultural features such as roads
 - 3) indications of ethnicity
3. What architectural styles are represented and how do they reflect age, ethnicity and socio-economic conditions? To address this question, information on the following topics must be collected:
 - a. Farmhouse
 - 1) style: high style, vernacular, pattern book, etc.
 - 2) evidence of ethnicity
 - 3) building sequence and additions

- 4) socio-economic indications
- 5) construction method and materials
- b. Barn
 - 1) barn type or style
 - 2) relationship to function and crop
 - 3) changes over time
 - 4) construction method and materials
- c. Outbuildings
 - 1) relationship to function and crop; specialization
 - 2) changes over time and abandonment
 - 3) construction method and materials
- d. Workers' housing
 - 1) style and capacity
 - 2) building sequence and additions
 - 3) socio-economic indications
 - 4) changes over time and abandonment
 - 5) construction method and materials

Economics of Agriculture

1. What is the evidence for self-sufficiency in early row crop/truck farms? To address this question, information on the following topics must be collected:
 - a. Nature and variety of crops
 - b. Size of farms and physical plant
 - c. Evidence of barter economy
 - d. Marketing of surplus
2. How is the development of a market economy traced in the physical and documentary record? To address this question, information on the following topics must be collected:

- a. Reasons for evolution from self-sufficient farms and physical manifestations thereof
 - 1) size of farms
 - 2) new structures and changes in building types
 - b. Response to changing market trends
 - 1) changes in crop types
 - 2) changes in level of production
 - 3) pricing structure
 - 4) competition from other producers
 - c. Marketing procedures and structure
 - 1) transportation and distribution network
 - 2) agricultural settlements as collecting points and processing centers
 - 3) destination and retail
 - d. Comparison of economic and marketing structure with other agricultural areas
 - e. Changes over time
3. What are the effects of financing arrangements on farm operations? To address this question, information on the following topics must be collected:
- a. Extent and impact of mortgaging; foreclosures and consolidation
 - b. Financing of capital improvements, equipment and seed
4. What are the nature and extent of cooperative ventures? To address this question, information on the following topics must be collected:
- a. Milling and processing
 - b. Distribution and marketing

Farming Practices and Methods

1. How did the use of fertilizers develop? To address this question, information on the following topics must be collected:

- a. Affordability
 - b. Effects on yield
 - c. Effects on the natural environment
 - d. Changes over time
2. How is the evolution of harvesting methods evidenced on row crop/truck and berry farms? To address this question, information on the following topics must be collected:
- a. Effects on yield and pricing
 - b. Harvesting machine technology
 - 1) affordability
 - 2) social impact: decline of migrant workers
 - 3) changes over time
 - c. Direct and indirect effects on the natural environment
3. What is the impact of specialization and how is it reflected in farm plans? To address this question, information on the following topics must be collected:
- a. Reflections in farm size and plan
 - b. Economic ramifications

Settlement, Ethnicity and Population

1. Cultural mapping: what are the discernible settlement patterns attributable to agricultural development? To address this question, information on the following topics must be collected:
- a. Early agricultural siting
 - 1) road and transport network
 - 2) associated settlements
 - a) agricultural collection, processing and distribution sites
 - b) satellite services
 - c) social organizations, churches and government

- b. Evolved agricultural settlement pattern to 1850
 - 1) road and transport network: inter-farm, inter-settlement and to markets
 - 2) associated settlements; growth and evolution
 - c. Effects of introduction of railroads on agricultural settlement pattern
 - d. Agricultural settlement pattern in the interior: berry farming
2. What is the evidence for ethnicity and how is it reflected in the material culture of a farmstead? To address this question, information on the following topics must be collected:
- a. Traditional ethnic farming regions
 - 1) relationship to farm type/product
 - 2) settlement, processing and marketing patterns
 - 3) reflections in social, economic and class structure
 - 4) changes over time
 - b. Reflections of ethnicity in farm plans and operations
 - 1) plan and architecture
 - 2) artifacts as indicators of farm activities, social customs and economic class
 - c. Migrant workers
 - 1) housing and living standards
 - 2) artifacts
 - 3) social and economic class
 - 4) decline due to technological advances
3. What are the population trends and mortality rates associated with agricultural regions and communities?

Gristmills

1. What is the nature of early gristmill operations on farmsteads? To

address this question, information on the following topics must be collected:

- a. Nature of operation and economics
 - b. Physical plant: size, layout and level of operational technology
2. What are the siting requirements? To address this question, information on the following topics must be collected:
- a. Environmental criteria
 - b. Economic criteria
3. What are the differences in physical plant and operations in private vs. cooperative ventures? To address this question, information on the following topics must be collected:
- a. Differences in size, physical plant and operation
 - b. Economics
 - c. Changes over time
4. What is the evidence for the evolution of technology? To address this question, information on the following topics must be collected:
- a. Hydropower system
 - b. Interior machinery
5. What information can locational data yield about operations, economics and agricultural products both locally and regionally? To address this question, information on the following topics must be collected:
- a. Proximity to roads
 - b. Access to markets
 - c. Proximity to other gristmills
 - d. Proximity and relationship to farmsteads
6. What is the physical and documentary evidence for the domestic life and socio-economic status of gristmill workers? To address this question, information on the following topics must be collected:
- a. Miller's residence

- b. Artifacts
- c. Association with other activities
- d. Successional use of site

Other data which should be recorded include hydrology, vegetation and soils.

Documentary and other data sources which should be consulted in any research effort include:

- Rutgers University Extension Service
- Rutgers, New Jersey room: Hartman Collection
- Pennsylvania Horticulture Society
- Pennsylvania Historical Society
- New Jersey Historical Society
- County Cultural and Historical Commissions
- Local Historical and Genealogical Societies
- Society of Friends Genealogies
- Agricultural History Society
- Hagley Museum, Eleutherian Mills
- U.S. Agricultural Census
- Office of New Jersey Heritage
- U.S. and New Jersey Census of Manufactures (for gristmills)
- New Jersey Dept. of Transportation road return index map (State Archives)
- U.S. Dept. of Agriculture aerial photos
- USGS and Soil Conservation Service maps
- County Atlases and other historic maps (State Archives)
- Oral history
- Title abstracts

- Deeds, wills and inventories
- Farm journals
- Grange records
- Historic Architectural Survey and Preservation Planning Project: Village of Whitesbog, Historic Conservation and Interpretation, Inc. 1982.
- Special Committee Report on the Condition of Child Labor on the New Jersey Cranberry Bogs, N.J. Child Labor Committee, 1914-15.
- The Early Windmills of New Jersey and Nearby States, Weiss, H.B., 1969.
- A Survey of Farmsteads on the Inner Coastal Plains, Manning, A., 1983 (Office of New Jersey Heritage).

Research questions relating to the farmstead plan and spatial relationships may be resolved at an individual site by a thorough recording of the remaining physical plant and by compilation of historic maps and any other documentary evidence related to farm function. Historic maps and an archaeological site plan will satisfactorily answer questions of siting, acreage and farm layout. Historic structures reports and HABS/HAER level recording will provide sufficient data for any topic relating to architecture.

Questions concerning the economics of agriculture are broad and fairly speculative and may not be fully answerable from the existing physical and documentary record. For the most part, farm ledgers and specific information regarding farm yield do not survive. Therefore, these questions may usually be considered resolved when agricultural census data has been extrapolated and when farm size and product have been determined from maps and auger samples. Financing practices are fully documented through county and bank records and cooperative ventures determined to the extent possible through historic maps that locate gristmills and distribution networks.

Documentary evidence, such as is presently extant, will resolve questions of farming practices and methods. A thorough review of state and federal agricultural census data, USDA and other federal publications and old machinery catalogues will satisfy information needs in this category to the extent possible.

A combination of archaeological data recovery, historic map evidence and examination of historic directories and agricultural and population census materials will be sufficient to address research goals pertaining to settlement, ethnicity and population. When traditional ethnic farming areas have been mapped and correlated with information

about material culture at individual sites, these goals will have been met.

Data sufficient to answer research objectives for gristmills will be gained when these sites have been thoroughly recorded archaeologically. When data has been collected from a number of sites within the region, answers to broader questions about the functioning and economics of gristmills should be attainable.

Following is a list of individuals and events significant in the broad patterns of regional, state or national history who have been associated with Pinelands agriculture. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS
ASSOCIATED WITH
PINELANDS AGRICULTURE

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
John Webb bogs - 1840s (Cassville) and William Braddock (Shamong)	Early developers of cranberry	All berry farm types
Joseph J. White	Advanced cranberry cultivation through horticultural experi- ments and design of bogs and machinery (1870s- 1920s)	All berry farm types
Martin L. Haines	Founder of Haines Bogs at Hog Wallow (1860s), now the largest bog system in New Jersey	All berry farm types
Elizabeth White	Cranberry grower and developer berry farm of the first commer- cial cultivated blueberry crop (1916)	All types
Joseph Wharton	Philadelphia businessman (Wharton School) and owner of vast tract of the central Pinelands where row crop and berry farming was pursued (1870s)	All types
Theodore Budd	Early cranberry grower and founder of the N.J. Cranberry Growers Union (1860s)	All berry farm types

SIGNIFICANT EVENTS
ASSOCIATED WITH
PINELANDS AGRICULTURE

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Establishment of Burrs Mill Bogs - 1830s	Probably the first successful cultivated cranberry bogs in New Jersey	All berry farm types
Cultivation of berries at Whitesbog - 1916	First successful commercial blueberry crop	All berry farm types

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of individual agricultural sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definitions

Agricultural sites are defined as a locus of activity associated with growing, processing, distribution or marketing of agricultural products. Agricultural sites are either a:

Historic farmstead - A site established at least 50 years ago with two or more structures devoted to agricultural pursuits or to the housing of agricultural workers; examples include the Liepe Farm in Hamilton Township and Whitesbog in Pemberton and Manchester Townships; or

Isolated agricultural site - A site or structure at least 50 years old which is not located on a farmstead, but which was built for the processing, storage or marketing of agricultural products. Examples of such sites would include gristmills and associated structures and cranberry packing and sorting houses.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Agricultural Sites

If a cultural resource survey uncovers evidence of an agricultural site, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any historic farmstead or isolated agricultural site whose physical remnants are capable of addressing one or more of the research questions identified in the "Research Priorities" section (p. 59ff.) of this chapter or any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

(2) Association with events significant in local, regional, state or national history (see page 70 for a partial list of significant events associated with Pinelands agriculture):

Certain agricultural activities have had a profound effect upon the economy and the natural and cultural landscape of the Pinelands. The development of berry agriculture, principally in the second half of the 19th century, provided the interior of the region with a successional activity and a source of employment and income at a time when the iron industry was in steady decline. Those farmsteads which reflect the establishment or early history of the berry industry and sites where new techniques in cultivating, harvesting or processing of the crop were introduced should be considered significant if they retain a high measure of physical integrity (i.e., a large proportion of the fabric from the time of their association with the early history of, or technological advances in, berry farming is intact and retrievable). Also significant are isolated agricultural sites which are early or rare examples of the storage, processing and distribution network of the berry industry.

Row crop and truck farmsteads and gristmills are significant when they retain integrity and are early examples of the development of agriculture on the Inner Coastal Plain or are directly related to a technological advancement that resulted in higher crop yields or improved harvesting or processing. Other farmsteads may be significant if they preserve evidence of major immigration episodes in the Pinelands and the traditional farming methods of various ethnic groups. Examples of such sites could include the poultry farms established by Eastern

European Jews throughout much of Atlantic County, the German wineries and Italian truck farms in the eastern and western portions of the county and the Russian farms in the Cassville area of Ocean County.

- (3) Association with significant persons in local, regional, state or national history (see page 69 for a partial list of significant persons associated with Pinelands agriculture):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in:

- cultivation, harvesting or processing technology; or
- the founding or advancement of cooperatives or other organizations that benefited Pinelands agriculture

- (4) Significant architectural or engineering components:

Resources eligible under this criterion include buildings and structures in a historic farmstead or isolated agricultural site that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands or served as a prototype for other buildings in a defined area;
- contribute to an understanding of ethnicity or socio-economic conditions through an examination of architectural style or building type or arrangement;
- represent a significant overall plan or design that has an architectural as well as functional dimension;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or

- represent an adaptation to a Pinelands specific agricultural activity

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that agricultural sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be an agricultural site with sufficient remains and the treatment recommendations set forth on pp. 46-47 apply.

c) Insufficient Remains:

If an agricultural site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant historic farmsteads and isolated agricultural sites. These special requirements pertain only to agricultural sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the agricultural site can contribute information. If this includes any of the "Research Priorities" identified on p. 59ff., the necessary documentation may

require research into such aspects of Pinelands agriculture as the relationship of the physical remains of the resource to economic networks and other factors important to understanding locational requirements, production, and distribution networks. The purpose of the research will be to define those factors important to the technological and economic development and operation of Pinelands agriculture that are not expected to be expressed by specific physical remains. Research may also be necessary in order to define the relationship of the farmstead to the natural landscape insofar as possible. Specific data on operation and management of the farmstead and the marketing of its products may also be required.

- When structures, features and equipment exist, appropriate drawings and/or photographs and written descriptions that document all agricultural operations must be prepared. A site plan that clearly defines the relationship of elements of the farmstead must be prepared. For all farmstead property types, the style/type, orientation, construction method and materials and the functional relationship of all operational features should be clearly elucidated. The spatial relationship of the structures in the complex, their relation to the growing areas and access to transportation and to markets must be understood. Documentation of the growing area should reference plot plan, size, crops and irrigation. If a gristmill is present, in addition to documenting construction technique, materials and style, record of the hydropower system and any operational evidence should be retained.

(2) Recording requirements for significant architectural or engineering resources

- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is:
 - ° a specialized adaptation to a Pinelands specific agricultural activity, or
 - ° an unusually complete example of an agricultural technology in the Pinelands with its important physical features well preserved.

GLASSHOUSES

General Description

Glassmaking is an activity in the Pines that encompasses much more than simply the manufacturing process. Related to the process is a pattern of settlements reflective of the hierarchical social and economic order of the industry and a pattern of resource use and exploitation that has affected and been affected by the prevailing natural environment.

The manufacture of glass in the Pinelands occurred for a little over a century, from 1799 to ca. 1920, but is still actively pursued elsewhere in the region. Salem (where production began in south Jersey in 1739) and Cumberland counties, southwest of the Pinelands jurisdictional area, remain glassmaking centers of major importance today.

The existing data base for the Pinelands is sufficient to identify with some confidence the major production sites, but little is known about the range of property types at each. The Pinelands historic sites inventory and a recently completed and far more comprehensive survey of glasshouses in south Jersey provide locational information derived from historic maps and documents, which can yield data about siting requirements, adaptation to the existing natural and cultural environment and the regional scope and impact. Information about intrasite patterns and features, however, remains deficient. The Pinelands inventory located all twenty-eight of the glasshouse sites in the Pines, but the descriptions are cursory, providing little more than the dates of operation and successional occupation of the site.

The more recently compiled Archaeological Survey of Historical Glasshouses in Southern New Jersey, produced by the Wheaton Historical Association, contains a complete list of glasshouses in ten southern New Jersey counties, including the Pinelands. The list, compiled from documentary records, describes location, dates of operation, chronology of ownership and the physical plant. Site inspections were conducted for the survey where possible and archaeological potential evaluated.

The existing inventories have most likely defined all the glasshouse sites in the Pine Barrens, but have inconsistently recorded the archaeological and architectural remnant. Furthermore, only one glasshouse site to date, that at Batsto, has been investigated at an acceptable level for research purposes and the excavations here concentrated on the manufacturing features. The resulting report was used as a basis for describing several of the property types that may be anticipated.

Glassmaking in the Pines is significant for its economic impact, the socio-economic order that prevailed at many glasshouse settlements, and the effect that the process had on the natural environment, both for fuel and for ore. Glasshouses and the realm of satellite activities associated with them provided employment for thousands of Pinelands residents and were the reason for the founding or growth of a number of

communities. The clustering of these sites in south Jersey near the necessary raw materials was a major contributor to the cultural map of the 19th century. The influence of glass manufacture on the natural environment, particularly for fuel for the furnaces, has yet to be accurately measured but, certainly in concert with the iron furnaces of about the same time, is considerable.

Historical Summary

Glass production in what is now the Pinelands National Reserve began in 1799 when the Eagle Works was built in Port Elizabeth. The industry expanded steadily from this point through much of south Jersey, especially within the Pine Barrens and to the west in Cumberland and Gloucester counties. By the end of the 1820s, there were six works in operation in the Pinelands; ten years later, this number had doubled. In 1840, there were twenty-eight glasshouses in New Jersey, predominantly in the southern part of the state, and thirteen of them were in the Pines.

South Jersey evolved into a major center of 19th century glass production because of the easy availability of the principal raw materials involved, wood and sand. Until the introduction of coal into the process in the mid 1800s, wood was the fuel used to stoke the various furnaces and ovens needed in the different stages of glass making. The seemingly inexhaustible supply of timber attracted the glasshouse owners as it did the iron smelters of roughly the same period. It was the sands north of the Delaware Bay, though, that particularly drew glass operations to this area. The sand deposits of south Jersey were abundant and of a type considered ideal for the fabrication of glass, high in silica content and relatively free of discoloring impurities and other soils.

With easy access to these essential raw materials, the glass industry grew and prospered through the mid 19th century. Even as late as the 1870s new factories were opening. By this time, however, glassmaking was in a general state of decline in the Pinelands and more works were closing than opening. The historical infrastructure of the industry was evolving into its modern state, as small independent operators went out of business and the remainder consolidated into a few larger, more efficient companies. Between 1862 and 1885, seventeen of the Pinelands glasshouses closed down. There were still quite a number of new factories entering the field - the major period of consolidation was in the 20th century - but these were virtually all further west in Gloucester, Cumberland, Salem and Camden counties. Those works in the Pines that did carry on into the 20th century were finally abandoned after World War I.

The glass industry in the Pinelands and throughout southern New Jersey has provided one of the major economic underpinnings in the area for almost two centuries. Many of the towns there owe their founding and their continued viability to the glassworks that are still in operation today. Other towns whose fortunes rose and fell with furnaces that shut down remain intact archaeologically. Much like the bog iron furnaces of the same era, the glasshouses generally spawned small

communities to shelter and serve the workers and a socio-economic system within these company towns that was based primarily on the job hierarchy in the factory. The physical remnants of these buried towns may provide information about that system.

The significance of the glass industry further extends to its effect on the natural environment. Sand mining would have had a fairly limited effect, but the amount of wood consumed by the furnaces was considerable and would have involved extensive clear cutting. Together with bog iron smelting, the glass works caused a denuding of much of the natural forest cover. The effects of this temporary deforestation and the subsequent successional growth are still evident in the Pinelands today.

Elements of a Glasshouse Site and the Glassmaking Process

Glass can be fashioned into two basic products, hollowwares and window lights. The manufacture of either required several buildings, including the main melting furnace, a pot house and a lime shed. If window lights were to be produced at the site, and if this were to be accomplished by the "cylinder glass" process, as was generally the case in south Jersey, an extra building known as a flattening factory was necessary. A cutting house, where individual panes were cut from large sheets, was also required only at window light sites.

In 1846, Jesse Richards, the last ironmaster at Batsto, built a glasshouse complex to supplement his faltering bog iron business. The complex, which produced window lights, remained in operation until 1867 and comprised at least seven and possibly eight structures. Although it was unusual in having two melting furnaces, the site is generally fairly typical of 19th century glass factories and will be used here as a model of what features may be anticipated at such sites.

The Batsto glass works were excavated in the mid 1960s by archaeologist Budd Wilson, working for the State of New Jersey's Department of Parks and Forestry. A fuller description of his results appears in Bulletin No. 27 of the Archaeological Society of New Jersey (December, 1971). Wilson's crew uncovered the remains of seven buildings plus a wood storage area for which no evidence of a shelter was found, though logically one might have been expected.

Remnants of the following property types were found at Batsto and can be expected to occur also at the other glasshouse sites in the Pines:

- Pot House:

The "batch," i.e., the raw materials for glass, was melted down in large terracotta pots that had to be carefully constructed to withstand enormous heat. These were made in the pot house and were also stored there for upwards of six months in order to dry slowly.

- Lime Shed:

A simple square or oblong building was used to store the lime that was mixed with the batch.

- Melting Furnace:

The melting furnace was where the glass was actually made, but the structure housed several related functions as well. The melting furnace and the flattening factory were the two most substantial and the most complex structures at any glassworks site and the most likely to leave considerable remains intact.

The building housed several ovens, but the largest of course was the melting furnace in the center. This was a large oblong or occasionally an oval structure of brick or stone with several small arched openings in the sides to allow access to the molten glass in the pots. At either end of the furnace was a "swing pit" where the glassblower, having drawn a "gather" of glass on his pipe and expanded it initially, would swing the pipe back and forth to elongate the glass into a long cylinder. This was the common technique for making window glass in southern Jersey. For making hollowwares, the mould would be located in the pit and the glass "gaffer" would blow a bubble of glass into the mould to form the desired piece.

Besides the central furnace, there were other smaller ovens in rooms along the periphery of the building. Ovens on the east side dried the wood used as fuel for the main furnace and the sand used to make the glass. At the southwest corner of the factory was a room where new pots were kept hot. Adjacent to it was the pot arch, an oven where the pots about to be used in the furnace were brought up to the proper temperature.

Wood ash from all the ovens was collected in a pit at the south end of the building and subsequently added to the batch.

- Flattening House:

Used only in the production of window lights, the flattening house processed the glass cylinders, each 8-10 inches in diameter, that came from the melting furnace. At its core was a circular furnace 18 feet in diameter, with a central oven and preheating and annealing sections. The cylinders, which had a crack along their length, were rocked back and forth with a wooden rod until they were flat and were then transferred to the annealing section.

- Cutting House:

This was a long, narrow building where panes of glass were cut from the sheets formed in the flattening house. They were then packed in crates for shipment.

- Settlement Associated Property Types:

Most of the glasshouses were in fairly remote areas and required housing and other facilities for the employees. The settlements would include:

- owner's mansion
- workers' housing
- company store
- carpenter's shop
- sawmill
- school
- church and cemetery
- barns
- agricultural outbuildings

The following description of the procedures involved in making glass is from Frank Leslie's Popular Monthly, Vol. 3, 1877, pp. 253-254:

"The workman secures on the end of his pipe a large mass of glass. He also rolls it upon the marver (iron table) in the same manner as he would for making bottles. Having formed the ball upon the marver until it assumes the shape of a pear, it is reheated and rolled a second time, and the bulb is further extended by blowing into it and resting the pipe on a horizontal bar. The blowing during the entire process is accompanied by manipulations of a peculiar character; blowing alone would not produce the desired result. The furnace holes are somewhat elevated, and platforms extend out from the base of the furnace, one for each hole or pot. These platforms have pits of considerable depth dug between them to permit the workmen to swing the bulb during the process of elongation. When the blast is forced into the plastic glass, the expansion takes place in that portion of the pearshaped mass called the neck. The workman now holds the ball over his head, and the weight of the thick portion of the mass presses down the expanded portion, until it assumes the shape of the top of a bottle. The expanded portion being now permitted to cool, which it does readily, on account of its thinness, becomes rigid. The workman then blows through the pipe, at the same time that he rotates it to keep up the cylindrical form of the expanding portion, and also swings the ball in one of the pits previously described, thus elongating the cylinder. When the walls of the cylinder have become everywhere of uniform thickness, and the proper length has been attained, the end furthest from the pipe being closed has a hemispherical form. This end is now subjected to a quick heat at the mouth of the furnace, and burst open by a strong blast through the pipe; the pipe being now rotated, the part thus burst open is expanded by centrifugal force to the size of the cooler parts of the cylinder. The cylinder is now laid in a frame, and the pipe detached. The ends of the cylinder are now cut off by winding a wad of plastic glass around them and suddenly cooling the ring thus formed. The cylinder has now to be opened. This is accomplished by placing a bar of hot iron longitudinally along the side of the cylinder, when sudden cooling cracks it from end to end. It is now

passed to the annealing furnace and flattening kiln. A cylinder of glass is laid in at the first opening of a peculiarly constructed furnace, the cracked side upward, and allowed to heat until it becomes plastic. As soon as this takes place the workman, by means of a winch, revolves the platform and opens a second cylinder, and so on until all in the furnace are ready to sink to a level. Thus we obtain flat sheets of glass out of cylinders, from which windowpanes can be cut of a size to suit the demand."

Hollowwares were either free blown or blown into a mould. Pressed glass was little favored in south Jersey. With free blown glass, the gaffer blew a bubble of glass at the end of his pipe and then formed it into the desired shape by "marvering" (rolling it on a polished stone), repeated blowing and shaping with hand tools. Glass was often blown directly into moulds for mass production, especially of bottles.

Present Status

Throughout southern New Jersey approximately 100 glassworks were built and operated for various lengths of time between 1739 and 1901. Perhaps 28 of these were within what is now the jurisdictional boundaries of the Pinelands. These were primarily located in the central and west central portions of the Pines, along the Mullica River and further west in the area of Waterford and Winslow. Other glasshouses were established to the south in Marshallville, Estellville and Port Elizabeth and to the north in Medford and Lebanon. Several of these sites endured for only a very short time but all required a considerable physical plant and a fair number of employees in order to enter into operation at all. Thus it is likely that few, if any, glasshouses, are utterly lost, though the precise location of some is open to question.

The present state of preservation of these sites is spotty. Overall, glassworks in the Pines must be looked upon as archaeological sites whose major value as cultural assets can only be realized through controlled excavation. A few, such as the glasshouses at Herman City, Estellville and Crowleytown, are in a relatively good state of sub-surface preservation while those at Lebanon, Bulltown and Medford have probably been destroyed. The remainder have left little or no trace at the surface but, like Batsto, probably have extensive foundation level features intact.

The anticipated general state of preservation for the elements of a glasshouse site is as follows:

Melting furnace - The melting furnace was an above-ground structure usually made of wood and therefore it would not survive. Substantial remains would exist at the surface and below, including the central furnace, swing pit, peripheral ovens, ash pit and foundations. Ovens were brick and the foundations were stone or brick.

- Pot House - Pot houses, as well as all the other buildings in a glass factory complex were generally frame and would leave no trace of the standing structure. Foundations should be extant. The site may be identified by the presence of clay residue.
- Flattening house - Like the melting furnaces, the flattening house would have left extensive remains below ground. Nineteen separate features were uncovered in the flattening house at Batsto, the most prominent of which was the circular oven made of brick. Ruins of the oven, the actual flattening stone on which the glass cylinder was rocked back and forth, and the annealing oven may be present.
- Cutting House - The foundations of the cutting house should be intact. Sites may be identified by waste shards from unused portions of the glass sheets and perhaps by traces of the straw used to pack the glass for shipment.
- Lime Shed - The lime shed was a simple structure which would leave behind foundations and a concentration of lime in the soil.
- Settlement - Foundations of the workers' housing and the privy behind each should be extant. Privies are particularly important since they were used as refuse dumps and thus provide evidence of the diet and material culture of the workers. Foundations of the company store may survive. Foundations of other settlement buildings - barns, carpenter's shop, school, root cellars, church - may also be present.

Research Priorities

Preservation priorities are dictated primarily by the gaps in knowledge that persist about a particular cultural resource and by identification of those physical features that can help fill those gaps. This entails an evaluation of the state of preservation of particular sites and the state of preservation of the resource group as a whole.

In virtually all respects, preservation priorities for the glass-house sites parallel those for the iron sites. This is because the nature and evolution of the sites in both resource groups were so similar. In each case the development of an individual site involved establishment of a distinctive settlement type which was dependent upon a central mill for its existence. Though the mills' output was different - glass vs. iron products - the settlement pattern and socio-economic system were the same. The community was dominated by a master who owned the mill, the mansion and the company store and who controlled the surrounding lands, while the workers lived in clusters of more modest housing.

Thus the research questions that remain and must be explored in the evaluation of a glass house site are similar to those for an iron site. As with iron, the glassmaking process is well understood and is not a major topic, though preservation of its physical remnant is essential to comprehend the site's raison d'etre. Investigation of the settlement is of greater importance to an understanding of Pinelands culture, as is the exploitation and long term alteration of the natural environment. The settlement plan and the spatial relationship of its components should be examined, with special emphasis upon artifact types in use in each of the functional/economic zones within the settlement. The permanent changes visited upon the Pinelands ecology by the combined exploitation of the iron, glassmaking and shipbuilding industries is another subject that must be addressed.

Because of the great variety of historic South Jersey glasshouses (with respect to size, condition, and complexity, etc.), it is not possible to generate specific recommendations which can be applied universally. The potential interdisciplinary linkages (historical, archaeological, geographical, economic, etc.) in the study of such sites, along with the constantly changing theoretical climate, also make it difficult to offer specific treatment recommendations except on a case-by-case basis. It will be necessary to treat each site according to its own characteristics, the immediate and long-term goals of investigators, the existing state of knowledge, and the nature of the impacting project.

All the glasshouse complexes for which some archaeological remains exist, possess at least a minimal element of integrity, viz., the potential to yield information about the past. The realization of this potential may require the exercise of ingenuity on the part of researchers, but this fact in no way diminishes the potential significance of the site involved.

Specific research questions have been suggested in the recently completed Archaeological Survey of Historical Glasshouses in Southern New Jersey, by Donald Pettifer, Alan Mounier, et al. These are presented below, along with suggested ways to address each topic.

1. What are the local siting requirements for glasshouses? To address this question, information on the following topics must be collected:
 - a. Ecological criteria
 - 1) proximity to ore and fuel sources
 - 2) proximity to water
 - b. Economic criteria
 - 1) proximity to cheap transportation
 - 2) access to labor force

- 3) cost of capitalization
- 4) economic incentives for establishing glass production

c. Changes in time and/or space

2. What are the effects of glass manufacturing on the natural environment of the Pinelands?

Among the best sources of data for the ecological criteria relating to siting and environmental impacts are the Soil Conservation Service maps, United States Geological Survey slope maps, Pinelands Commission vegetation maps, reports of the New Jersey State Geologist and the state topographic and geological maps. Data exist for the economic criteria, but analysis is hampered by a lack of a synthesis of the existing material. Among the sources available are community histories (to be used with caution), historic maps and atlases, Civil War draft registers (which list trades and occupations) and such day books as are still extant. Changes in time and space are best documented through archaeological means. Allied specialists who may help answer siting questions include cultural geographers and economic historians.

A determination of the location of key natural resources - sand, lime, wood and water - in glass production, through field inspection and the use of USGS quadrangle maps, federal and state soils and vegetation maps and historical atlases, would suffice to record the ecological criteria for siting. The field work should also document alterations made to the natural environment to accommodate factory operations.

Economic criteria can be adequately addressed through the historical record. Contemporary maps, atlases, census material and local directories will provide all the necessary information regarding transportation routes and the available labor pool. The cost of capitalization at an individual site and the economic incentives should be pursued to the extent possible through extant day books, company records, Corning Museum and Wheaton Village documents, U.S. Census of Manufacture data and old newspaper accounts. The documentation available for specific sites may not be sufficient to resolve questions of capital costs and economic incentives. Therefore, all the above sources should be examined thoroughly.

3. What are a site's physical plan and functional arrangement and how do they reflect production? To address these questions, information on the following topics must be collected:

a. Size, form and construction of factory

- 1) placement of furnaces, chimneys, windows, doors, etc.

- 2) relationship to kind of product
 - 3) relation to capital investment
 - 4) relation to size of work force
 - 5) relation to functional specialization
- b. Physical placement of factory relative to:
- 1) ancillary structures
 - 2) traffic pattern
 - 3) storage areas
 - 4) roads, railroads, watercourses
 - 5) community settlement plan
 - 6) supply facilities -- sand mines, saw mills, etc.
- c. Size and complexity of physical plant with respect to:
- 1) evolution of glassmaking technology
 - 2) kind and volume of product
- d. Changes in time and/or space

Data about the size, form and construction of glasshouse factories can be obtained from the Sanborn Insurance maps (for the second half of the 19th century), Hexamer maps (available in the Philadelphia Free Public Library), historic photos, local property maps and company stationery and promotional material. Archaeological investigation would also be useful in shedding light on subterranean features, such as tunnels, commonly associated with the glasshouses. For the physical placement of the factory relative to ancillary features, historic maps and photos are available, as is an oral historical record, at least for later periods. The size and complexity of the plant is best illustrated by controlled excavation, by glasshouse records, if extant, and by transportation logs, including railroad and harbor records and the Registry of Ships in Washington, D.C. (which contains cargo lists and may identify glasshouse products).

The minimum integrity characteristics needed to address questions about the form and construction of the mill and its physical placement relative to other structures involve essentially a survival of a perception of the original pattern and site plan. Any structural evidence of the factory or its support buildings would suffice to provide useful information, as would spatial

evidence of the original patterning. Even a surface concentration of artifacts may be sufficient to indicate location and function of features that have not survived. Some infrastructure elements of a glasshouse community, such as the road network, require little or no physical integrity since they can be adequately documented through the written record. To provide useful information about plant layout relative to technological evolution and products, however, a much higher degree of physical integrity is necessary. This type of data is too subtle to trace in the archaeological record unless a site is fairly well preserved.

Questions about the physical arrangement of a glass factory will be considered adequately resolved when the site has been thoroughly recorded archaeologically (including HABS/HAER documentation of standing structures). This information should, however, be compared with relevant historic documentation and recent literature to determine a site's place in glassmaking technology and how capital investments were used.

Allied specialists who should be consulted in the analysis of the physical arrangement of a glasshouse plant include labor historians, industrial historians, ethno-historians and industrial technologists.

4. What are the settlement patterns associated with glass production and how do they reflect economic and social conditions? To address these questions, information on the following topics must be collected:
 - a. "self-contained" factory towns vs. non-self contained towns
 - b. relation to:
 - 1) stage of industrial development
 - 2) business economy and capitalization
 - 3) evolution of overland transportation, especially rise of railroads
 - 4) limiting ecological and geographical factors
 - c. socio-economics
 - 1) company ownership of housing, store and other community buildings
 - 2) relation to prevailing economic conditions
 - nature of credit arrangements, payment of wages in cash or in kind, etc.
 - 3) relation to jurisprudence

- d. ethnicity as evidenced by the documentary and artifactual record
 - e. changes in time and/or space
5. How is the evolution of technology evidenced at glasshouse sites? To address this question, information on the following topics must be collected:
- a. stasis and change in glassworking technology
 - b. causes of innovation or lag in adoption of innovation
 - c. patterns of stasis and change in time and/or space
 - d. technology as reflected in product (material and type) and in facilities
6. What evidence of culture in transition is available from features and artifacts at a site? How did a community adapt to the failure of a glasshouse? To address these questions, information on the following topics must be collected:
- a. architecture:
 - 1) industrial buildings and features
 - 2) domestic buildings and features
 - 3) commercial buildings and features
 - b. adaptation and diversification of communities after glass industry died.
7. What were the procurement, production and marketing strategies of glass manufacturers in the Pinelands? To address this question, information on the following topics must be collected:
- a. sources
 - 1) ore sources
 - 2) collier mounds
 - 3) road network
 - b. product
 - 1) laboratory analysis of glass composition
 - 2) evolution of glass formulae
 - c. markets

- 1) kinds and styles of products
- 2) transportation networks

Archaeological evidence describing a settlement plan or pattern which could then be evaluated in terms of hetero- or homogeneity with regard to size, quality of life, position in community or socio-economic status would be an important data source. Tax maps and city directories, as well as company housing records, would be useful in defining worker and other factory related housing complexes which developed in established communities, and could provide a basis for comparison with archaeological data from self-sufficient community-type sites. Moreover, sources should not be restricted to residences. Related structures and the location of various functions within the factory complex varied with time. Shifts in plant orientation with changes in transportation would also yield information.

The following components should be identified within the community to provide a basis for comparison:

1. residences
2. transportation systems
3. glass factory complex
4. related industrial facilities
5. commercial facilities

Differences between self-contained company towns and more diversified settlements can be best recognized through a strategy combining field survey and a review of historic maps. When the nature and range of activities not directly related to glass production have been recorded, then sufficient data will be available for a comparison.

The relationship of settlement patterns to the stage of industrial development and economics is adequately addressed at a particular site when the physical plant of the factory has been recorded and compared with extant historical data relating to local economic conditions. Topographic and transportation factors are easily deduced from historical maps.

Settlement and socio-economic questions are resolved by indicating through company or municipal records, the extent of company involvement in housing, credit and the local economy.

From archaeological evidence of manufacturing one can infer process technology, product type, raw materials and fuels. Archaeological evidence may also be used to detect change in physical facilities through modifications to documented earlier structures as they adapted to new technologies or changing product demand.

Documentary evidence (catalogues, patents, factory plans, advertising, and factory records) is also important to compare or contrast archaeological findings.

The state of the technology in use at a site is determined by a thorough recording of the physical plant and its artifactual content. Company advertisements illustrating products or the factory, insurance maps and other historical maps and atlases should also be accounted.

With regard to cultural residues, architecture is satisfactorily documented by HABS/HAER level recording of buildings involved in or associated with glass production. Product types and composition are recorded sufficiently by examination of extant company records and promotional materials and recent research articles on glass production or by laboratory analysis of site materials. Local consequences of the demise of a glass factory are determined by addressing the evidence of census and tax records, directories and historical records and by the archaeological examination of material culture at residential sites.

In any individual glass factory inquiry, the greatest variety of company and non-company materials should be examined. Individual components can be compared on an inter-site basis. Any research question should utilize data from factory sites which went through generations of technological and social change, as well as those which reflect a single era. Specialists in the fields of technology, architecture, transportation, ecology, economic history, regional history and social history could all be of help in any of the above listed areas of inquiry.

Following is a list of individuals and events significant in the broad patterns of regional, state or national history who have been associated with Pinelands glasshouses. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS ASSOCIATED WITH
PINELANDS GLASSHOUSES

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
Stanger Bros.	Family extensively involved in the development of at least four glasshouses in the Pinelands	All
Richards Family	Famous iron magnates also involved in founding three glassworks	All
Daniel Estell	Founded Estellville works in the 1830s; lent his name to Estell Manor	All
William Coffin	Involved in works at Hamilton, Winslow and Green Bank	All
Jonathan Haines	Involved in works at Clementon, Hammonton and Waterford	All
James Brookfield	Involved in works at Cape May Court House and New Columbia	All
Andrew K. Hay	Involved in works at Hammonton and Winslow; instrumental in establishing the Atlantic City Railroad	All

SIGNIFICANT EVENTS ASSOCIATED WITH
PINELANDS GLASSHOUSES

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Founding of Eagle Works - 1799	First glasshouse built in the Pinelands, at Port Elizabeth	All
Introduction of mason jars - 1858	First developed at Crowleytown; allowed long-term storage of foods	All

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of individual glasshouse sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definitions

Glasshouse sites are defined as a locus of activity directly associated with procurement of resources for, or production or distribution of, glass implements. Glasshouse sites are either:

Glass community site - A settlement in which the manufacture of glass took place. The community encompasses the melting furnace and related mills and attendant structures, the residential buildings and those others that directly served the inhabitants, a company store, and whatever other structures were in existence at the site when the glasshouse was still in operation; a good example is the Estellville Glass Works in Estell Manor Park, Atlantic County; or

Peripheral glass site - A locus of activity separate from a glass community which can be shown to have directly served the glass manufacturing process. Examples may include docks, road systems for the import of raw materials and sand mining areas.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Glasshouse Sites

If a cultural resource survey uncovers evidence of a glasshouse site, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any glass community site or peripheral glass site whose physical remnants are capable of addressing one or more of the research questions identified in the "Research Priorities" section (p. 82ff.) of this chapter or any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

(2) Association with events significant in local, regional, state or national history (see page 91 for a partial list of significant events associated with Pinelands glassmaking):

Glassmaking in the Pinelands is a reflection of the Industrial Revolution as it occurred in more isolated, rural areas where mills tended to be discrete sites which spawned small communities of workers. The Industrial Revolution created a new social and economic infrastructure and transformed the natural and cultural landscape of America. In the Pinelands the glass industry's expansion in the first half of the 19th century promoted new settlements and transportation corridors and significantly affected the natural environment. Those glasshouse sites that reflect the establishment and early history of this industry or its advancement and evolution through technological innovations should be considered significant if they retain a high measure of physical integrity (i.e., a large proportion of the fabric from the time of their association with the early history of, or technological advances in, glass production is intact and retrievable). Also significant are glass community sites that portray the social and economic impact of glassmaking through well preserved workers' quarters and communal activity areas. Peripheral glass sites that retain integrity may possess significance if they demonstrate the glass related process involved at the site or the effects on the natural environment wrought by glassmaking.

- (3) Association with significant persons in local, regional, state or national history (see page 90 for a partial list of significant persons associated with Pinelands glassmaking):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in the fields of:

- developing an economic base for a community, the Pinelands, the state or the nation through involvement in the glass industry;
- glasshouse design;
- glass manufacturing technology; or
- functional glass design or art glass.

- (4) Significant architectural or engineering components:

Resources eligible under this criterion include buildings and structures in a glass community site or peripheral glass site that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands;
- illustrate a period of development in the construction of melting furnaces or structures housing ancillary functions in the Pinelands, the state, or the nation;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- illustrate a distinctive architectural tradition representative of an ethnic group that settled in the Pines.

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance

must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that glasshouse sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be a glasshouse site with sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If a glasshouse site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant glass community sites and peripheral glass sites. These special requirements pertain only to glasshouse sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the glasshouse site can contribute information. If this includes any of the "Research Priorities" identified on p. 82ff., the necessary documentation may require research into such aspects as the relationship of the physical remains of the resource to economic networks and other factors important to understanding locational requirements, production, and distribution networks. The purpose of the research will be to aid in identifying the socio-cultural reflections in the artifactual record and

define those factors important to the technological and economic development and operation of the glasshouse complex that are not expected to be expressed by specific physical remains. Research may also be necessary in order to define the relationship of a glasshouse complex to the natural landscape insofar as possible. Specific data on construction, operation, and management of the glassmill and the marketing of its products must be addressed in the historical research. Sufficient research must be conducted to identify all stages of the glassmaking process and the evolution of the glass community.

- When structures, features, and equipment exist, appropriate drawings and/or photographs and written descriptions must be prepared that document all aspects of the glassmaking process and/or the glasshouse site. A site plan that clearly defines the relationship of elements of the glassmaking process or community must be prepared.
- (2) Recording requirements for significant architectural or engineering resources
- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is an unusually complete example of a glassmaking technology in the Pinelands with its important physical features well preserved.

IRON FORGES AND FURNACES

General Description

With the introduction of iron smelting in the Pines in the 18th century came a pattern of settlements and satellite sites, a distinctive intrasite socio-economic order and natural resource exploitation on a scale that is apparently still echoed today. Iron production was a major determinant of the early cultural landscape and patterning in the region. As such it represents a great deal more than simply the adaptation of technology to a particular environment.

Bog iron manufacture lasted for a century in the Pines, from 1765 to ca. 1860. Because it used as its ore a resource limited mostly to the Pine Barrens, its geographical limits are almost entirely confined to that region. Some iron was also produced to the north, however, at sites in Monmouth County.

The major sources of information for this resource group are the Pinelands Commission historic sites inventory and two 20th century studies of the industry, Iron in the Pines by Arthur Pierce and Early Forges and Furnaces of New Jersey by Charles Boyer. All of these works are basically oriented toward location, production and technology. Information about settlement and related aspects of culture is lacking. Thus, though there is good general locational information which can relate to siting and patterns of cultural geography, there is little archaeological or other evidence to provide site specific data. The Pinelands inventory is derived primarily from the other two sources as well as from historic maps and atlases. All of the roughly thirty iron sites in the Pines are located exactly or proximately, but the descriptions provide little more than the dates of operation and successional occupation of the site, if any. Boyer and Pierce furnish a great deal more historical information about the evolution and production at each site and reproduce historic maps and photos where available. Although both Boyer and Pierce obviously visited the iron sites and presented information about their then current state of preservation, the potential for archaeological investigation is nowhere explored.

Intrasite information regarding site plan, architecture and the surrounding settlement is provided only sporadically in the existing data. Better documented are the historic bog iron smelting process and furnace construction methods: see "The Bog Ore and Bog Iron Industry of South Jersey," by J. A. Starkey in the Bulletin of the New Jersey Academy of Sciences, vol. 7, no. 1, 1972. Fortunately, one iron settlement, Batsto, is partially preserved and restored and serves as a model for architectural styles and site plans. Rare examples of architecture can also be found at Weymouth (workers' housing, but in ruinous condition) and Atsion (restored iron master's mansion).

The bog iron industry ushered in the first wide scale, demonstrable pattern of settlement in the Pinelands. With the furnaces came settlements for the workers, peripheral communities and sites to serve the

industry and the burgeoning population, a network of roads to link them and a relatively stable economic base on which to grow. The natural environment of the Pines was affected by the cutting of the forest for fuel and by turfing of the forest floor for charcoal mounds. The industry is also associated with significant persons and events in Pinelands history. The Richards family was prominent in bog iron production for over seventy years and was responsible for much of the material culture that remains today. The Revolutionary War Battle of Chestnut Neck was precipitated by British attempts to destroy the furnace at Batsto which was supplying the Continental Army.

Historical Summary

Production of pig iron and iron products had already begun in New Jersey by the early eighteenth century, as attempts to suppress the industry at this time in the English Parliament will attest. Iron smelting occurred throughout New Jersey, though the types of ore being exploited in the northern and the southern sections of the state were markedly different. For the furnaces of north and central Jersey, such as the well-known Long Pond Iron Works and Ringwood Furnace, the conventional "hard" ores were mined - magnetite and red hematite. But in the Pines the furnaces were charged with bog ore, a renewable limonite ore that deposits naturally along the banks of the major river systems, especially the Mullica and the Wading Rivers.

Bog ore derives from ferric oxides that occur in the glauconitic iron-rich clays underlying much of the Jersey lowlands. Waters laden with natural organic acids sink down and permeate these layers, leaching the highly soluble iron from the clays and carrying it to the surface. The oxygenated iron precipitates as hydroxide flocs and travels along feeder streams and rivers. It eventually sinks into the stream banks and forms a hard, thick crust. These encrustations along banks, in coves and in swamps are the bog ore beds that were mined for approximately a century in the Pinelands.

The smelting of bog ore in the Pines began in earnest in the 1760s under the impetus of Charles Read of Philadelphia. Between 1765-1770, Read set about the building of four forge and furnace sites, an ambitious enterprise that required a staggering capital outlay. In the end, his venture resulted in financial ruin, but others took over his operations at Taunton, Aetna (Medford Lakes), Atsion and Batsto. Because of Read's initial interest, by the 1770s the bog iron industry was firmly established.

In the late 18th century, and as long into the 19th century as the iron works prospered, various members of the Richards family were easily the most influential in the industry. Beginning with William Richards' acquisition of Batsto in 1784, the family enterprises eventually expanded to include some of the most important forge and furnace sites. But the family's period of hegemony also extended to the years of decline starting in the 1840s.

The July 1, 1840, edition of the Camden Mail and General Advertiser noted presciently, "It is suggested that the recent application of

anthracite fuel to the smelting of iron ore will be very injurious, if not fatal, to the iron works of New Jersey." In 1830 approximately 24 forge/furnace sites were still in operation in the Pinelands. Half of these had closed by 1850 and the remainder were silent by 1870. Anthracite coal proved to be a far more efficient fuel than wood and Pennsylvania magnetite a purer ore and easier to mine. Other factors probably also played a part in the downfall of bog iron production. The ore itself proved not to be so quickly renewable as had been estimated and forges were forced to import pig iron to keep busy. The Civil War created a serious manpower shortage in what was a labor intensive endeavor. Cash flow problems and credit sales also contributed to chronic financial problems. In any event, the New Jersey bog iron industry eventually could not compete economically and the furnaces shortly fell into ruin.

In Iron in the Pines, Arthur D. Pierce wrote, "History in the Pine Barrens really begins with iron." Of course a rich and varied prehistoric culture had existed for 10,000 years before iron smelting began locally and historic period settlement, especially along the coast, was common enough by 1700. Yet it seems that the extensive exploitation of the interior of the Pines, and the accompanying increases in population, can indeed be traced to the emergence of the bog iron industry in the latter 18th century.

In addition to the population growth directly attributable to iron production, the industry supported satellite activities that also brought in people and affected the cultural landscape. Sawyers and colliers depended on the furnaces for all or part of their livelihood. The iron towns encouraged the growth of tavern settlements and a network of roads for the transport of raw materials and finished products. Maritime trade prospered by carrying iron pigs, bars and finished items to other ports-of-call and returning with goods sought by the local populace. The natural environment was significantly altered by the strip cutting of the forest to provide fuel for the smelting process. Finally, the bog iron furnaces played a noteworthy role in the American Revolution, providing weaponry for the Continental Army and precipitating the Chestnut Neck massacre and other incidents when the British attempted to interdict the iron supply.

In short, bog iron exploitation was highly significant in the development of early Pinelands historic period culture. Its effect on present culture is far more limited since the industry has not been practiced for over a century and the dramatic population growth it fostered evaporated after its demise. Even today though, it is not entirely without effect. Some Pinelands towns owe their early impetus to the iron industry as do the routes of many sand roads. The effect on the environment is harder to measure, but consumption of wood by the forges, bloomeries and furnaces and the denuding of the forest floor to turf the collier's mounds has left a permanent legacy.

Elements Of A Forge/Furnace Site And The Iron Smelting Process

The following description of a furnace and the method used to produce iron are taken from Charles Boyer's Early Forges and Furnaces in New Jersey (pp. 4-5):

"Both bog ores and the hard iron ores, were reduced to metallic iron in the blast furnaces. The furnace consisted of a four-sided stack of stone or brick, about twenty feet or more in height and twenty to twenty-four feet square at the base, tapering toward the top to about sixteen to twenty feet square. Within this structure and separated by a lining of sand or broken stone was a center core, made of fire bricks or other refractory material and open at both ends. It resembled in shape "a large hen's egg standing on its largest end," about ten feet in diameter at the widest part and eight feet at the top, and rested on a square chamber also built of fire bricks, called the hearth. Three of the sides of the hearth descended to the hearthstone, but on the fourth side was a partial partition of fire brick, called "the tympan," which was supported just above the hearthstone and separated the front and back portions of the hearth. On each side of the stack were arches extending into the masonry, through which the air-blast pipe, or "tuyere," extended, while in the front arch were two outlets for drawing off the molten iron and the fused slag, or "cinder."

"A fire was now kindled on the hearth and kept going until the furnace stack was thoroughly heated, when a small charge of ore, charcoal, and flux was added in alternate layers, and the air blast turned on. The flux in the northern sections of New Jersey consisted of limestone, and in other places where limestone could not be obtained oyster shells were substituted. The purpose of the air blast was to keep the molten mass in a state of agitation and introduce the necessary amount of oxygen to complete combustion and produce the intense heat required to separate the metal from the accompanying impurities. As the mass was melted the impurities or dross rose to the top and the metallic iron gradually sank to the bottom. The slag or dross was drawn off through the upper outlet from time to time and the iron tapped from the lower opening every nine or ten hours. The latter was run through long gutters in the sand called "sow" moulds and then into crude oblong depressions in the sand called "pig" moulds.

"From time to time as the iron was drawn off, new charges were introduced into the top of the furnace, the process being a continuous one during the blast. In the earlier furnaces a "blast" seldom exceeded sixteen to eighteen weeks, which was about the limit that the lining of the furnace would stand under the intense heat. Later, as the ironmasters obtained more experience, and better heat-resisting materials were found, the length of a blast was increased to seven or eight months."

At the functional center of any iron community stood the furnace or forge. Very often the two were in tandem at the same site. A furnace

was used in the initial process of smelting iron from iron ore under intense heat. Its product was called "pig iron," a brittle, porous metal with many impurities. A forge took pig iron and refined it into wrought iron, a more malleable and useful product created by reheating the pigs and then pounding them with quarter-ton forge hammers to remove the carbons and associated impurities. A bloomery was originally a type of furnace/forge combination that turned out bar iron (wrought iron) directly from the ore, but used a voracious amount of fuel in the process. The term bloomery was widely misused, however, and is not a reliable indicator of function.

The individual elements of a forge/furnace complex would of course vary somewhat from site to site, as would their spatial relationship. Factors which would govern which components occurred at each site include the size of the settlement and its furnace operation, its financial success, the adaptability of the surrounding environs, and pre-existing or co-existing cultural activities on the site or in the vicinity. In any event all of the iron communities would have shared at least the following property types:

- Forge or Furnace (with a casting house and a ramp leading to the top of the stack):

A casting house was a frame structure abutting the forge/furnace where the molten iron was formed into moulds. The iron flowed from the hearth through channels in the casting house floor to the moulds.

- Stamping Mill:

The water powered stamping mill consisted basically of a huge iron hammer that was used to crush bog ore before it went to the furnace.

- Water Wheel (with associated gears and shafting leading to the bellows):

The bellows were also water powered and were tightly fitting wood cylinders called tub bellows. They pumped air into the hearth, thereby creating the "blast" needed to produce high temperatures.

- Coal House:

The "coal" house was where the charcoal fuel was stored.

- Road System

- Slag Heap:

The slag heap was the by-product of the smelting process. Slag often contained enough iron residue that, after cooling, it was crushed along with fresh ore in the stamping mill and returned to the furnace.

- Scale House (at later sites):

The scale house was where the "charge" was measured before being dumped through the top of the stack into the hearth. The charge consisted of the charcoal fuel, the flux (usually clam shells) to draw off impurities and the ore.

- Settlement Associated Property Types:

Each iron community necessarily spawned a settlement to serve the considerable population required to operate the forge/furnace. The extent and variety of the settlement naturally depended on its size. In its day, the largest of them, Batsto, had several hundred residents. The physical plant of these settlements would include:

- ironmaster's mansion
- workers' housing
- company store
- carpenter's shop
- school
- church and cemetery
- barns
- agricultural outbuildings

These settlements are more than simply an addendum to the story of the iron industry. They represent crucial evidence of social organization and cultural diversity and are the most promising source of new information these sites possess.

Other features associated with iron production were more likely to occur only at some of the larger complexes:

- docking facilities
- rolling mill
- slitting mill
- sawmill

All the forges and furnaces had to be located near a water source to operate the bellows and hammers. Where the channels were deep enough for ships, the advantages were obvious. Thus docking facilities were built wherever possible. A rolling mill flattened out heated bar iron to produce sheet iron. A slitting mill took the sheet metal and punched out rods and nails.

Present Status

From various sources it would appear that there were a total of approximately 29 furnace/forge sites at one time or another in the Pines. There could conceivably have been several more that have since disappeared without a physical or documentary trace, but that prospect is unlikely. The sites were of such size and prominence, and in general of sufficient duration, that they could hardly have escaped notice completely. Thus in the case of this particular resource group the entire remnant evidence has apparently been identified.

Forge/furnace sites were scattered along the major drainage systems throughout the Pinelands. A particular concentration of iron sites occurs along the Batsto/Wading/Mullica system, but others are found on the Rancocas, Cedar Creek and Toms River watersheds to the north and the Egg Harbor, Tuckahoe and Maurice River drainages to the south.

The present state of above ground preservation of iron sites is not good. For the most part the sites are valuable as archaeological entities, with likely intact foundation level remains of the forge/furnace and all or most of the attendant structures. In general, the anticipated state of preservation for the various elements of an iron site is as follows:

- forge/furnace with casting house - No above ground components remaining in place, though some building elements and associated artifacts may be scattered about the vicinity. Because of the massive nature of the construction, it is likely that a considerable sub-surface structural remnant is extant. Perhaps the casting house channels and moulds at the former floor level are also preserved.
- stamping mill - Most likely originally a barn-like frame structure located near the river. The iron hammer, anvil and metal waterwheel gears may be in the vicinity or they may have been carted off for scrap. Foundations of the structure and raceway system (canals to carry water to and from mill wheel) should survive.
- bellows - Made of wood and leather and unlikely to be extant. The same is true of the water wheel that powered the bellows, but raceways should be still present.
- coal house - Perhaps foundations remain. A concentration of charcoal in the area would identify it.
- road system - Some may still be in use, others detectable by a relative lack of vegetation; should leave a hard packed soil stratum.
- slag heap - Likely to still be in evidence.
- scale house - Foundation remains may survive; a concentration of charcoal, iron ore and shells would identify it.

- docking facilities - Piles for docks as well as bank stabilizers and possible warehouse foundations may be present.
- rolling and slitting mills - Foundations of the structure and elements of the hydropower system (raceway channels and metal gearing and shafting) may have survived. Perhaps some parts of the original machinery may be buried among the foundations.

Research Priorities

A number of factors go into the evaluation of an individual site and together dictate the priorities for its preservation. These include:

- the state of preservation of the particular site
- the general state of preservation of the resource group as a whole
- the historical significance of the site and resource group to Pinelands cultural development and evolution
- the data gaps (i.e., the research questions) that remain unresolved about the resource group.

Since there are very few above-ground structures extant, the state of preservation of any particular iron site is essentially an archaeological question and can only be determined by survey and sub-surface testing. No evaluation of a site can be undertaken until such testing is accomplished.

The general state of preservation of the forge/furnace sites is difficult to assess without a current survey, but is probably moderately good. A majority are located in undeveloped or relatively undeveloped areas and are thus less likely to have suffered modern incursion. Nor was there much development on the sites historically, following the collapse of the iron industry. Several of the sites supported other milling operations in the latter 19th century, but the general level of occupation of the former iron communities was much reduced. A number of them were in fact abandoned when the furnaces shut down. Overall then, most of the sites should provide sealed and fairly undisturbed deposits below ground containing invaluable information about Pinelands life.

The research questions that should be addressed during the exploration of any iron site deal more with the nature of the settlement and the exploitation of the natural environment than with the technical processes of iron production. The manufacture of iron is fairly well documented, though evidence of evolution and innovation in the technology would be useful. The iron towns brought a new socio-economic system to the Pines, not unlike a plantation, with a large, decorous mansion for the ironmaster, a company store and support structures controlled by the master, and a cluster of more modest workers' housing. The spatial relationship and the artifact types in each of these zones should be studied and compared. The artifact assemblage may also provide information about the diet, activities, life style and ethnic diversity of the

various inhabitants. Exploitation of the environment both to feed the furnace and to support the community is another question that should be considered. How the iron towns adapted to and used the environment and the permanent changes wrought as a result are major topics for research. Suggested specific research questions are discussed below.

1. What are the siting requirements for forge/furnace sites? To address the question, information on the following topics must be collected:
 - a. Ecological criteria
 - 1) proximity to ore and fuel sources
 - 2) proximity to water
 - b. Economic criteria
 - 1) proximity to transportation
 - 2) cost of capitalization
 - c. Changes over time
2. Physical plant: what are the plan and functional arrangement and how do they reflect the nature and level of production? To address these questions, information on the following topics must be collected:
 - a. Size, form and construction
 - 1) relation to capital investment
 - 2) relation to size of work force
 - 3) annual output
 - b. General site plan relative to:
 - 1) ancillary structures
 - 2) transport network
 - 3) settlement structures
 - 4) supply facilities
 - c. Changes over time
3. What are the settlement plans and reflections of ethnicity, population trends and socio-economic class in evidence at iron

communities? To address these questions, information on the following topics must be collected:

- a. Settlement plan and social factors
 - 1) socio-economic and employment hierarchy as reflected in settlement plan and artifactual remnant
 - 2) evidence for ethnicity
 - a) architecture
 - b) intra-settlement pattern
 - c) artifact assemblage
 - 3) general standard of living as deduced from architecture, documentary and artifactual assemblage
 - b. Distinctions in manufacturing process or product fostered by religious differences of owners
 - c. Socio-economics
 - 1) company ownership of housing, store and other community buildings
 - 2) relation to prevailing economic conditions
 - a) credit arrangements for workers
 - b) levels of employment and production over time
 - d. Population
 - 1) increases in population caused directly or indirectly by bog iron industry
 - 2) changes in population and ethnicity over time
 - 3) depopulation with collapse of iron manufacturing
 - e. Intensity and permanence of settlements at various iron sites
 - f. Satellite settlements
4. What are the economic ramifications of iron production with regard to financing, credit arrangements and levels of production under various circumstances? To address these questions, information on the following topics must be collected:
- a. Nature of product at various sites over time

- 1) level of production
 - 2) response to economic and technological changes
 - b. Cost of capitalization
 - 1) effects on size of operations
 - 2) reflections in settlement
 - c. Credit sales of iron
 - 1) failures due to undercapitalization
 - 2) payments to workers
 - d. Production during wartime
 - 1) nature of output during American Revolution and War of 1812
 - 2) general economic effects of both wars on the bog iron industry
 - a) loyalists and iron production
 - 3) Effects of Civil War on production
 - a) demand for iron
 - b) manpower shortage
5. What are the effects of iron production on the natural environment and how did depletion of ore sources affect the industry? To address these questions, information on the following topics must be collected:
- a. Acreage utilized by forge/furnace for fuel
 - b. Effects of turfing for charcoal production on forest understory
 - c. Decline of bog ore from overmining
 - d. Successional use of altered areas
 - 1) cranberry bogs in mined areas
 - 2) row crop agriculture in deforested areas
6. What is the comparative evidence for technology at different sites and how did the technology of iron manufacture evolve over time? What smelting or forging processes are in evidence at various periods and at what sites? To address this

question, information on the following topics must be collected:

- a. Adoption of improvements to forge/furnace system or hydropower system over time
 - 1) reflections in site plan or artifacts
 - 2) economic impact
 - b. Comparative technology among iron sites
7. What is the evidence for successional use of former iron sites? To address this question, information on the following topics must be collected:
- a. Reasons why some sites were reutilized
 - 1) environmental factors
 - a) water power
 - b) exploitable resources in vicinity
 - 2) economic factors
 - a) proximity to market or transport network
 - b) available labor force
 - b. Nature of reutilization
8. Why did the iron industry decline and what were the cultural effects of its demise? To address this question, information on the following topics must be collected:
- a. Reasons for decline
 - 1) exhaustion of iron sources
 - 2) capitalization problems
 - 3) reduced demand for iron
 - 4) competition
 - b. Effects on population and settlement
 - c. Effects on local and regional economy

The following sources should be among those consulted in any effort to address the research questions listed above:

- Early Forges and Furnaces in New Jersey, Charles Boyer

- Iron in the Pines, Charles Pierce (Both Boyer and Pierce list valuable additional references)
- A Precise History of the Iron Manufacture of the American Colonies, S.B. Pearse
- History of the Manufacture of Iron in All Ages and Particularly in the United States for Three Hundred Years, from 1585 to 1885, J. M. Sivank
- Charles Hartman Collection at Rutgers University
- Hagley Mills Museum (Eleutherian Mills), Delaware
- Records of the New Jersey Secretary of State, New Jersey State Archives (for Certificates of Incorporation and for petitions for dams)
- United States Census of Manufactures
- New Jersey Census of Manufactures
- Records of the East and West Jersey Proprietors
- U.S. Forest Service, N.J. State Archives (for aerial surveys from the 1930's)
- Ocean County Museum
- County cultural and heritage commissions
- County and local historical societies
- New Jersey Historical Society
- Historical Society of Bucks County, Pennsylvania
- Historical Society of Pennsylvania, particularly the Clement records (genealogies and survey maps)
- Local informants
- Historic maps and road returns (N.J. State Archives)
- New Jersey and federal censuses
- State and local tax records and ratables
- County and municipal historians (listed by the New Jersey Historical Commission)

Iron company day books:

Dover - Monmouth County Historical Society
Martha - Hagley Mills Museum
Weymouth - Atlantic County Historical Society and
Rutgers University
Batsto - Batsto
Durham - Bucks County (Pa.) Historical Society
and
Greenwich

The Burlington County Historical Society and Rutgers University possess various iron company records also.

The question of which property types are best able to address the research topics and the minimum integrity characteristics they must possess to be useful can be best approached by dividing the resources into three groups - production related resources, settlement related resources and the outlying natural and cultural environment. The production related resources will yield information pertaining to siting, physical plant, technology and the economics of the trade. These resources include the forge/furnace, stamping mill, all elements of the hydropower system, the coal house, scale house, rolling mill, slitting mill and the slag heap. Siting and physical plant can be addressed if a reasonable foundation remnant is extant. More detailed information about the mill plant and technology will be available only if interior features of the structures or original hydropower installations are intact. Questions of economics (and of all the research topics) can only be fully explored if there is documentary evidence and a reasonable artifact assemblage surviving.

Settlement related resources may provide data relating to physical plant and economics as well as social information. In situ foundations and a secure artifact assemblage are the principal requisites if the physical culture is to yield information. Further information may be derived from day books and any surviving ledgers from the company store.

The outlying cultural and natural environment will generate data relating to all the acknowledged research questions excepting physical plant technology and successional use. Satellite communities are a good source of information for settlement, economics and decline of the industry provided that these sites retain a secure artifact record and either physical or documentary evidence of their components.

Allied specialists who may be called upon in the research effort include cultural geographers, industrial archaeologists, economic historians and botanists.

Research questions for siting requirements may be satisfied by incorporating evidence derived from field inspection, USGS quadrangle maps, federal and state soils and vegetation maps and historical

atlases. The physical plant can be adequately recorded through field investigation which may be later compared to company day books and any other existing documentary evidence. Detailed field recordings will also satisfy the data requirements at individual sites for questions of technological evolution.

Research objectives relating to the remaining themes - settlement and population, economics, the effects on the natural environment, successional occupation and decline of the iron industry - are generally rather broadly conceived and entail compiling and comparing data from a series of sites. Some of the questions may never be fully resolved, given the level of documentary and physical evidence available. Sufficient information may be considered to have been gathered at individual sites when the following sources have been taken into account:

- a. full archaeological, architectural and natural resource recording of the site;
- b. census and directory information indicating population, employment and ethnicity trends over time;
- c. sufficient cartographic evidence to determine historic features and natural resources locally and regionally;
- d. company day books, newspaper accounts, bank records, deeds and inventories and other legal records and any other historical documentation that may shed light on the cultural and economic implications of iron production.

Following is a list of individuals and events significant in the broad patterns of regional, state or national history who have been associated with Pinelands iron sites. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS ASSOCIATED WITH
PINELANDS FORGES AND FURNACES

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
Charles Read	Established the first furnaces in the Pines at Batsto, Taunton, Atsion and Aetna (Medford Lakes) 1765-1770	All
Col. John Cox	American patriot and manager of Read's iron enterprises; succeeded Read as ironmaster of Batsto in the 1770s	All
Gen. John Lacey	American patriot and founder of Bamber Forge (1810); lent his name to Lacey Township	All
Benjamin Randolph	American patriot and founder of Speedwell Furnace (1770s)	All

SIGNIFICANT EVENTS ASSOCIATED WITH
PINELANDS FORGES AND FURNACES

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Founding of iron furnace at Batsto - 1765	Founding of the first bog iron furnace in the Pinelands	All
Battle of Chestnut Neck - 1778	Battle site of Revolutionary War; precipitated by attempt of British to sail up the Mullica River to attack iron works at Batsto	None

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of individual iron sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definitions

Iron sites are defined as a locus of activity directly associated with procurement of resources for, or production or distribution of, bog iron implements. Iron sites are either:

Iron community site - A settlement in which the smelting or forging of iron took place. The community encompasses the forge/furnace and related mills and attendant structures, the residential buildings and those others that directly served the inhabitants, a company store, and whatever other structures were in existence at the site when the iron works was still in operation; or

Peripheral iron site - A locus of activity separate from an iron community which can be shown to have directly served the iron manufacturing process. Examples may include docks, collier sites, mill dams and ore mining areas. The hydropower canals near Taunton and Weymouth Furnace are good examples.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Iron Sites

If a cultural resource survey uncovers evidence of an iron site, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any iron community site or peripheral iron site whose physical remnants are capable of addressing one or more of the research questions identified in the "Research Priorities" section (p. 104ff.) of this chapter or any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

(2) Association with events significant in local, regional, state or national history (see page 113 for a partial list of significant events associated with the Pinelands iron industry):

Production of iron in the Pinelands is representative of the nascent phase of the Industrial Revolution in America. The Industrial Revolution created a new social and economic infrastructure and transformed the natural and cultural landscape of America. In the Pinelands the bog iron furnaces and forges are the earliest expression of the movement toward industrialization. During the course of the 19th century the centralization of facilities and effort gradually became the norm and most of the early rural sites faded into history. In their day, however, the iron sites of the Pines promoted settlement, dominated the local economy and significantly affected the natural environment.

Those iron sites that reflect the establishment and early history of this industry or its advancement and evolution through technological innovations should be considered significant if they retain a high measure of physical integrity (i.e., a large proportion of the fabric from the time of their association with the early history of, or technological advances in, iron production is intact and retrievable). Also significant are iron community sites that portray the social and economic impact of iron smelting and forging through well preserved workers' quarters and communal activity areas. Peripheral iron sites that retain integrity may possess significance if they demonstrate the iron related process involved at the site or the

effects on the natural environment wrought by bog iron processing.

- (3) Association with significant persons in local, regional, state or national history (see page 112 for a partial list of significant persons associated with Pinelands iron sites):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in:

- developing the economic base for a community, the Pinelands, the state or the nation through involvement in the iron industry;
- the field of engineering technology in the Pinelands, the state, or the nation;
- the design of bog iron facilities or advances in production technology; or
- the outcome of the Revolutionary War.

- (4) Significant architectural or engineering components:

Resources eligible under this criterion include buildings and structures in a iron community site or peripheral iron site that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands;
- illustrate a period of development in the construction of forges, furnaces or structures housing ancillary functions in the Pinelands, the state, or the nation;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- illustrate a distinctive architectural tradition representative of an ethnic group that settled in the Pines.

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that iron sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be an iron site with sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If an iron site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant iron community sites and peripheral iron sites. These special requirements pertain only to iron sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the iron site can contribute information. If this includes any of the "Research Priorities" identified on p. 104ff. the necessary documentation may require research into such aspects as the socio-economic

conditions, ethnic configuration and population trends that prevailed during the period the iron site was in operation. Research should also define the relationship of the physical remains of the resource to economic networks and other factors important to understanding locational requirements, production, and distribution networks, must be conducted. The purpose of the research will be to aid in identifying the socio-cultural reflections in the artifactual record and define those factors important to the technological and economic development and operation of the iron site complex that are not expected to be expressed by specific physical remains. Research may also be necessary in order to define the relationship of an iron site complex to the natural landscape insofar as possible. Specific data on construction, operation, and management of the iron site and the marketing of its products must be addressed in the historical research. Historical evidence on the adaptation of methods and techniques to local conditions and the evolution of technology should be cited. Documentation on the conversion of the site to a successional use should also be compiled. Sufficient research must be conducted to identify all stages of the smelting or forging process and the evolution of the iron community.

- When structures, features, and equipment exist, appropriate drawings and/or photographs and written descriptions must be prepared that document all aspects of the smelting or forging process and/or the iron community site. A site plan that clearly defines the relationship of elements of the smelting/forging process or community must be prepared.
- (2) Recording requirements for significant architectural or engineering resources
- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is an unusually complete example of the smelting/forging technology in the Pinelands with its important physical features well preserved.

MARITIME ACTIVITIES

General Description

Maritime activities encompass a broad range of sites and cultural pursuits which focus generally on shipping and its support facilities. Chief among these are dock areas and ports-of-call, whaling, shipbuilding, shipwreck sites, navigational aids and alterations to the coastal and riverine environment meant to accommodate pursuits oriented toward the seas. This is among the very earliest of the resource group activities to appear in the Pines, predating even the English seizure of the colony in 1664. Though some boat building and minor harbor facilities still exist today, the significant historical activities related to this group for the most part do not extend much beyond the turn of the century. Its geographical limits extend the length of the Jersey coast and up navigable rivers, many of which were passable much farther upstream historically than they are today.

The data for this resource group derives primarily from 19th and 20th centuries maritime histories, gazetteers and the Pinelands historic sites inventory. Diaries and eyewitness accounts sometimes quoted in these sources contribute to a sense of place and time, but are often anecdotal and sketchy about specific details. As is the case for most of the Pinelands resource groups, information about material culture is conspicuously lacking. Given the length of time over which these activities were pursued and the intensive and repeated building phases along the coast, it is unlikely that the full cultural complement related to maritime sites will ever be recorded.

Analysis of these sites and their ability to yield significant information suffers greatly from the lack of a systematic survey of maritime related resources. Though there is a wealth of first-hand accounts and primary source materials, they are scattered and piecemeal and highly specific in subject matter. There are also municipal histories for many of the coastal towns of Ocean, Atlantic and Cape May Counties, as well as topical histories relating to various aspects of the shore communities. Some of these contain information about physical growth and development, but only rarely in a systematic fashion. The material culture and operations of actual maritime related activities are even less well documented, though harbor records and the registers of New Jersey ports-of-entry do provide cargo, tonnage and other shipping data. These are a good reflection of local economic conditions and the level and diversity of the region's physical culture. Several municipalities, including Hamilton and Dennis Townships, have formed or are forming local historic districts which encompass structures related to maritime enterprises, such as housing built for shipyard owners and ship's captains. The inventories and Register nominations for these districts are a good source of information for trends in architecture, but not specifically for activities oriented toward the sea. Among the most useful sources of architectural information for maritime related settlements are recent historic sites inventories undertaken for Burlington and Ocean Counties and for the Great Egg Harbor and Tuckahoe River watersheds. These contain brief but useful entries on much of the 18th and 19th century architecture in seafaring communities along south

Jersey's coasts and rivers. The Pinelands Commission inventory gives a list of sites, landings and settlements associated with seagoing activities, but with little or no reckoning of the extent of the past or present material culture.

Generalized accounts abound of the earlier seafaring history of the Jersey coast, among the best of these being Nelson's The New Jersey Coast in Three Centuries. For shipwrecks Leland Downey's Broken Spars is among the most comprehensive listings, but it does not attempt to assess the present status of these sites. The historic accounts of Jersey's maritime past, many of which are referenced (along with a good list of maps) in Zinkin's Place Names of Ocean County mostly suffer from a similar lack of specificity in assessing physical remnant.

In sum, there are 59 maritime related sites listed in the Pinelands inventories and at least another 870 shipwrecks off the Jersey coast. These constitute the bulk of the major sites in the Pines, but others may be anticipated.

The significance of maritime activities lies in their longevity and, consequently, their early influence on settlement in the Pines. Whaling and shipbuilding initiated the first pattern of settlement, albeit along the coast, in the Pinelands and focused attention on the interior by promoting sawyering. By the 19th century shipbuilding and shipping were major economic points of focus, providing export facilities for Pinelands products and enriching the material culture of the region. Several sites are significant in American history, since the Jersey coast was a center for privateering activity during the Revolution and a target for British retaliation.

Historical Summary and Significance

"It is beyond doubt that the early settlement of the lower portions of the New Jersey coast was due to the belief that it would prove a profitable field for whalers." (Nelson, The New Jersey Coast in Three Centuries, 1902, p. 427).

The earliest European occupation of southern New Jersey was along its littoral, from the Atlantic around Cape May to the bay and up the Delaware River. Although the interior of the Pinelands remained almost entirely uninhabited by whites until the end of the 17th century, whaling interests were already well established in the Delaware Bay by 1658. In 1678, licenses were being issued to individuals for the taking of whales in the Barnegat area and further north. It is clear that the fishing industry, primarily whaling but also the commercial exploitation of oysters, provided, along with military excursions, the major impetus for initial settlement in southern New Jersey. The military ventures, like the whaling stations, were along the coast and relate primarily to Swedish attempts to establish a foothold along the Delaware Bay and River in the first half of the 17th century. These efforts began in 1643 with the founding of a fort near Salem Creek and resulted in a series of military installations upriver almost to Trenton. All of them were abandoned in 1655 when Peter Stuyvesant led an armed expedition to the area to reassert Dutch control.

Whaling and oyster fishing proved to be much longer lived and far more significant to the early cultural development of the Pinelands. The shore installations that they fostered for safe harbor and for processing their catch brought permanent settlement to the periphery of the Pines and resulted eventually in exploration of the interior. By 1693 the whaling industry in Delaware Bay was so lucrative that the Assembly passed a measure providing for a 10% tax on the value of the "oyl and bone" to be paid to the Governor. In 1698, whale oil and bone were described as the leading products of Cape May County (Gabriel Thomas, History of West Jersey). Such a profitable business naturally encouraged expansion, creating a need for more whaling ships. The wood to build those ships was to be found in the Pinelands. Thus, New Jersey whalers had begun to reach into the Pines for its wealth of natural resources by the close of the 17th century, helping bring about the network of sawmills, settlements, and roads that formed the initial phase of historic period physical culture in the region. The industry itself died out in the early 19th century, a victim of its own prosperity. The whales were injudiciously hunted to near extinction and the business became unprofitable in the late 1700s. Whaling activities off the Jersey coast had ceased entirely by the end of the War of 1812. Oyster fishing on the other hand continued unabated throughout the 19th century and, in fact, by the turn of the 20th century was the largest of the fishing pursuits in New Jersey. Together these early commercial fisheries helped promote the initial patterns of development along the southern New Jersey shore and provided, by the latter 17th century, an economic impetus for settlement further inland.

The shipbuilding industry in south Jersey, which by 1700 was well established and serving the whaling fleets around Delaware Bay, eventually grew to eclipse whaling utterly as the major maritime activity in the Pine Barrens. The earliest record of shipbuilding in New Jersey was at Perth Amboy in 1683, though the industry was probably already in operation before that time. Construction of ships is attested in Cape May by 1688, and in 1694 the Assembly passed legislation to promote shipbuilding throughout the state. The industry grew prodigiously in the 1700s as shipyards opened all along the coast and up the major rivers. Small specialized boats and ships were produced in great quantity in these years and thereafter, while vessels of ever increasing size became more and more common on the stocks as time passed. The smaller coastal vessels, the first types built on the Jersey shore, were designed to serve the locals in the gathering and transporting of the region's natural resources. These include the garvey, used in clam and oyster fishing, and the sail scow, which was put to use carrying salt hay from the marshes. Open whaleboats, with deep gunwales for greater storage capacity, began to be produced in the area ca. 1750. A variation on this design was used effectively during the Revolutionary War to harass British merchant ships. The Durham boat was developed somewhat later, after the introduction of bog iron smelting in the Pinelands, and was intended to transport ore to the furnaces. Washington used a Durham boat in his famous passage across the Delaware. Perhaps the most celebrated of the small boats that originated in south Jersey, though, was the sneakbox, which first appeared in the 1830s. Hunters used these "melon seed" shaped vessels to approach waterfowl unobtrusively. Hunting of coastal fowl for market was a significant economic activity

during the 19th and early 20th centuries and much of the credit for its success can be traced to the development of this boat form.

Larger ocean going sailing ships were also being built along the south Jersey coast during the 18th century. Sloops and schooners of up to 30 tons were constructed in the earlier 1700s and larger brigs were being built in Tuckerton late in the century. Eventually, ships of 300 to 800 tons were launched from south Jersey shipyards which drew their lumber from the Pine Barrens.

The yards that built these ships grew in number through the 18th and much of the 19th centuries. Tuckerton was a principal among them and a port of entry for the United States at the time, making it the major seaport of the region in the 1800s. Large, ocean going craft were built here and at Mays Landing, Dennis Creek and Dorchester. The latter three yards date to the late 19th century and produced some of the biggest ships. Smaller coastal vessels were also constructed at Tuckerton as well as Waretown, Forked River, Gardiner's Basin (Absecon), Toms River, and Barnegat. Still other shipyards, most of them from the 19th century, were operating at Clarktown, Bargaintown, Port Republic, Tuckahoe, and Leesburg. The actual number of shipyards that existed along the south Jersey coast is difficult to estimate. Many were small operations and short lived and have left little trace. Some towns had several shipyards and not all of these are well documented.

Along with shipbuilding, shipping was a major activity along the Jersey coast. There were at one time 600 ships licensed to ply their trade on the Maurice River. It was not uncommon for ships built here to be loaded with merchandise, sailed to the West Indies or Europe and sold along with their cargo. Lists of 19th century shipwrecks attest to the volume of shipping that moved along the coast. Many of these vessels put out from, or were bound for, Jersey ports-of-call. The following description of Tuckerton by an early 19th century visitor, recalling its 18th century prosperity, gives an indication of the impact of the bustling maritime trade on the region,

". . . the river was filled with masted vessels. It was a place rich in money. As farming was but little attended to, taverns and boarding-houses were filled with comers and goers. Hundreds of men were engaged in the swamps cutting cedar, and saw mills were numerous, always cutting cedar and pine board. Many shipyards were there, where vessels were built and loaded out to the West Indies. New York, Philadelphia and the southern and eastern cities received their chief supplies of shingles, boards and iron from this place. The trade in iron castings was very great. The numerous workmen, all without dependence on soil, required constant supplies of beef, pork, flour, groceries, etc., from abroad. Even the women wore more imported apparel than in any other country places. Merchants from New York and Philadelphia went there occasionally in such numbers that the inns and boarding-houses could not contain them, and they had to be distributed among private houses. On such occasions they would club and have a general dance,

and other like entertainments. The vessels from New York and New England on trading voyages were numerous before the Revolution. The inlet was formerly the best on the coast, and many vessels destined for Philadelphia, in the winter, because of the ice in the Delaware, made into Egg Harbor River, and there sold out their cargoes to traders from New York and Philadelphia." (Nelson, 1902, pp. 437-438).

With such a volume of shipping activity, it is not surprising that the coast is littered with wrecks along its entire length. Many of these wrecks represent invaluable archaeological sites and not all are in open waters along the shore. More of the Pine Barrens rivers were navigable in the 1700-1800s than is the case today and there were numerous landings along them frequented by small trading vessels. The possibility of a significant archaeological remnant in what are now deceptively modest stream courses is higher than one would expect. At Lumberton recent bridge reconstruction over the Rancocas Creek uncovered cast iron pigs from the furnaces at Batsto and Atsion. Presumably the larger courses have an even higher incidence of historic ship sites. Ships captured by American privateers and later sunk during a British counterraid in 1778 have been located at the bottom of the Mullica River. The wreck of the schooner "Weymouth," built around 1870, is still visible in the Egg Harbor River at Mays Landing. Other ships that had outlived their usefulness were regularly driven up against the shore in order to stabilize the banks and prevent erosion. These remain along the marshes and streams of the Pine Barrens, covered with decades or even centuries of accumulated silt and vegetation, but still capable of providing information about maritime enterprises in southern New Jersey.

The daunting incidence of shipwrecks along the coast gave early testimony to the need for navigational aids, particularly lighthouses and harbor lightships. The earliest lighthouses in New Jersey were intended as alarms, though, rather than as guides. A light erected in 1746 across the harbor from New York was meant to warn of the approach of hostile French ships and signal the local militia to assemble. The first navigational beacon in New Jersey (though at the time it was a part of New York) was built in 1764 at Sandy Hook. It was a stone structure 106' high with a copper lamp fueled by fish oil. In the next century and a half fourteen more lighthouses and three lightships were added on the coast from Sandy Hook to the Delaware Bay. Six of the houses and one ship were situated south of the Toms River - at Barnegat, Absecon, Ludlam's Beach, Hereford Inlet, Cape May, and Five Fathom Bank. The Barnegat lighthouse is now a National Historic Landmark.

The significance of maritime enterprises to the cultural evolution of the Pinelands lies both in their early date and in their economic impact upon the region. Whaling stations accounted for most of the very earliest settlements on the south Jersey coast. The need for wood to build and expand these settlements, and to build still more ships, prompted some of the first forays into the Pinelands interior to set up sawmills and satellite communities. As the shipbuilding industry grew, thousands of individuals and the economies of whole towns became involved. The need for wood for this industry, as for bog iron smelting and glassmaking, contributed to the depletion of the forest and had

long-term environmental consequences. Shipping activities at ports along the coast and the bay contributed greatly to the local economy, providing a market for Pinelands exports (wood, "coal," iron, glass) and allowing local residents access to goods not obtainable otherwise. Overall, maritime related activities had a dramatic effect on Pinelands culture, contributing to its nascent development, sustaining a large workforce in the 19th century particularly, and dictating coastal settlement patterns which in turn affected patterns further inland.

Elements of a Maritime Site and Present Status

Maritime activities encompass a variety of site types whose physical components, plan and siting characteristics vary substantially. The principal types of maritime sites that occur in the Pinelands include shipbuilding yards, shipping centers (both large port facilities and smaller landings upriver), navigational and lifesaving stations, and shipwrecks (bank stabilizing efforts as well as sinkings). The shipbuilding yards are those which were normally the most extensive and involved the greatest number of individual features. Of course, many of the yards, especially those which produced small coastal boats, were extremely modest in size, range and number of facilities. Bay boats and small whaling boats were often the product of a single craftsman or a family. These have left no trace except in those rare instances where the boat building tradition has been kept alive. The larger shipyards though, where multi-ton vessels were assembled, comprised a variety of facilities necessary for the different phases of construction. Most prominent among these were the wet and dry docks and the stocks where ships were built or repaired. There would also have been a sawmill in constant operation in the yard, cutting planks and specialty pieces to order. Nearby, other wood would have been turned on a lathe for masts, rails and other items. Anchors, chains and metal fixtures were forged by a blacksmith whose shop was also in the shipyard. Depending on the size and scope of the yard, other operations may have been carried out there or contracted to local suppliers. A cooperage was essential to shipbuilding since barrels were needed to store water and provisions on the newly fitted ship. Furniture could be made on the premises or again farmed out to a local mill. Space was also required either on-site or close by for glaziers, ropemakers and riggers, painters, joiners and other woodworkers. Tar and turpentine were used to seal the ship and protect the wood; they were either produced in kilns and stills in the yard or were obtained from an outside source. All these various activities generated a need for storage capacity and it seems certain that warehouses would have been a prominent feature of any Pinelands shipyard.

Not surprisingly, shipping sites were often found in close proximity to shipyards in the major south Jersey ports. The features directly associated with them include simply the wharves and docks, the warehouses and the network of immediate access roads. If the site was a port-of-entry for the United States, then a customs house would also have been a part of the complex. Smaller landings were a feature all along the navigable waterways of the Pinelands. Some of these were built specifically to serve a nearby manufacturing site, such as the (no longer extant) piers at the Forks of the Mullica River, where Batsto

iron was shipped out. Similarly, Green Bank, downstream from the Forks, developed as a port facility for a glasshouse. Others developed as local trading centers, spawning small settlements such as Lower Bank and Clarks Landing. Some of these survived, but most have not, save for their archaeological component.

Shipwreck sites can often include a considerable number of ships over a fairly large area, especially if the site is one where old hulks were being used as bank shoring. Navigational and lifesaving stations were often in tandem and comprise at a maximum a lighthouse, a home for the keeper, and a shelter for the lifeboats.

In summary, the major property types associated with maritime enterprise include the following:

Shipbuilding yards

- wet/dry docks
- stocks
- sawmills/lathe
- blacksmith shop
- cooperage
- turpentine still
- warehouse

Navigational aids

- lighthouse
- lighthouse keeper's residence
- lightships

Shipping sites

- wharves/docks
- warehouses
- access roads
- customs house

Shipwreck sites

- off-shore shipwrecks
- bank stabilizers

Lifesaving stations

- station house
- lifeboat shelter

The present state of preservation of this resource group is not encouraging. Although many sites reflective of the Pinelands maritime heritage are still extant, they are mostly "captain's houses" and other settlement features not directly related to maritime activities. Shipyard sites are not fully inventoried, so their overall state of preservation is not known. Many of the known shipbuilding areas however are now occupied by later development and their remnant has been obliterated. Port sites for shipping are subject to constant renewal and rebuilding and their historic component is quickly lost. In fact the most promising area to search for intact remains of maritime history is not on land at all, but in the water. The shipwrecks littering the banks and bottoms of Pinelands rivers constitute the most intact and unbiased record of maritime pursuits that remains in the Pinelands. Undisturbed since their demise, these ships contain information relating to cargoes, nautical technology, military history, economics, and social and living standards that is not obtainable elsewhere. Though difficult to record properly, they possess great potential for shedding light on the maritime history of the Pinelands.

Research Priorities

Research into maritime activities in the Pinelands should be carried out both in the field and in the documentary record, particularly in archival materials such as Customs files, photographs and insurance reports.

The shipping industry had a significant impact on the economy, on settlement patterns and on the material culture of the Pinelands and its people. Cargo receipts and any other records pertaining to export and import of goods should be examined as part of any study of an individual port. In the case of a small upriver landing, the reason for its founding and its association with a local industry, if any, should be addressed. Whether it primarily served as a dock for the mill or as a more general distribution point for area commerce is a point that should be resolved. The physical relationship and prominence of a port or landing with regard to the settlement it spawned should be fully documented and those features of the settlement attributable to maritime pursuits should be recognized. Sites within such settlements should be examined for artifactual materials indicative of the local economy and living standards and whose occurrence is attributable to the presence of port facilities.

Careful attention should be paid to any surviving archaeological components of shipbuilding sites. The yards themselves and identifiable workers' housing sites should be explored to determine types of ships built, regional variations on design or construction methods, and the material culture at the housing sites. Documentary information that pertains to the rise and demise of the yard and the industry in general should also be compiled, if possible.

Shipwreck sites, which include the oldest and most intact evidence of maritime activities in the Pinelands, deserve special treatment. Most are presumably well sealed at present and not subject to tampering. Should excavation of such a site be undertaken, cargoes, ship type and method of construction, ship fittings and equipment and personal items of the crew should be recorded to the extent possible.

Six separate categories of historical maritime activities associated with the Pinelands have been identified. A series of research questions was developed for each of the six, which include shipping, shipbuilding, whaling, navigational aids, shipwreck sites and commercial fishing. For all of these categories of physical culture, researchers should keep in mind broader questions relating to settlement and succession. How these activities affected the distribution of peoples over the landscape and how they influenced the development of communities and Pinelands based industries are major research topics which should not be ignored. Patterns of successional activities over time and their reflection in the local and regional economy should also be explored. The impact of various maritime activities, especially shipbuilding and whaling, on the natural environment, should be weighed and it would be useful to document the effects of erosion and the shifting shoreline configuration on the coastal culture.

More specific research questions pertaining to particular activities include:

Whaling

1. What are the settlement patterns associated with whaling and how do they reflect ethnicity and socio-economics? To address these questions, information on the following topics must be collected:
 - a. Evidence of ethnicity
 - 1) architecture
 - 2) settlement plan
 - 3) artifact assemblage
 - b. Socio-economic class
 - 1) relationship to occupational hierarchy
 - 2) reflections in settlement plan
 - c. Comparison/contrast with other maritime communities
2. What are the mortality rates throughout whaling communities? To address the question, information on the following topics must be collected:
 - a. Whaling related
 - b. Non-whaling related
3. What are the economic implications of whaling with regard to social class and how was financing arranged? What was the commercial structure of the industry? To address these questions, information on the following topics must be collected:
 - a. Processing of product
 - 1) nature, extent and type of local processing
 - 2) physical plant; layout and location
 - b. Marketing of product
 - 1) export markets
 - 2) transport network
 - 3) return trade/imports
 - 4) market conditions over time

- c. Support industries
 - 1) nature, location and type
 - 2) local service infrastructure
 - d. Socio-economic class structure spawned by whaling related industries
 - e. Financing and capitalization
 - f. General economic effects of decline of whaling: local and regional
4. How did whaling change over time and what was the impact of its decline? To address these questions, information on the following topics must be collected:
- a. Social and economic effects
 - b. Environmental effects; rapid loss of whale population
 - c. Successional industries
 - 1) reflections in population
 - 2) intra-community plan evidence

Shipbuilding

1. What are the siting requirements? To address this question, information on the following topics must be collected:
- a. Proximity to natural resources
 - b. Harbor requirements
 - c. Relationship to types of ship being built
2. How were ships built and how did the technology change over time? To what extent is the construction method traceable in shipyard plans and artifacts? To address these questions, information on the following topics must be collected:
- a. Local or regional variations in design or construction
 - b. Materials procurement
 - 1) evidence at shipyard for local production of components
 - 2) evidence for nature and origin of non-local materials
 - c. Shipyard plan and features
 - 1) relationship to types of ship being built

- 2) adaptation to changes in ship type
- d. Specialization in shipyards
 - 1) job classification
 - 2) types of ship built
- e. Changes in technology over time
- 3. What is the economic impact of shipbuilding and what were the financing arrangements? To address these questions, information on the following topics must be collected:
 - a. Local and regional economic effects
 - reflections in material culture
 - b. Financing and capitalization of shipyards
 - marketing and financing of new ships
 - c. Economic reasons for the decline of the industry
 - 1) local and regional impact
 - 2) successional activity
- 4. What is the evidence for ethnicity and socio-economic class and how is it reflected in the physical and documentary record? To address these questions, information on the following topics must be collected:
 - a. Ethnicity in shipyard occupations
 - b. Socio-economic class structure and shipyard occupations: hierarchy
 - c. Reflections of ethnicity and social class in local settlement
 - architecture, community plan and artifacts
- 5. What is the normal complement of related support facilities and how do they reflect the cultural milieu? To address these questions, information on the following topics must be collected:
 - a. Reflections of ethnicity
 - b. Evidence for standard of living among population
 - c. Adaptation to decline of industry

Shipping

1. What are the siting requirements for ports and upriver landings? To address this question, information on the following topics must be collected:
 - a. Upriver landings in coastal ports
 - b. Environmental and topographic criteria
 - c. Economic criteria
 - 1) relationship to local industry
 - 2) proximity to markets
2. Upriver landings: what is the nature of their physical plant and functions? How does an upriver landing reflect local settlement and economics? To address these questions, information on the following topics must be collected:
 - a. Original function: mill dock or distribution point for area commerce
 - b. Nature of cargo exports
 - c. Related transportation network
 - d. Evidence for imports and level of material culture
 - e. Nature and size of related settlement
 - f. Part played in local commerce and economy
 - g. Relationship to Pinelands industries: dependence of industries on shipping
3. What was the extent of coastal shipping and what was being transported? To address these questions, information on the following topics must be collected:
 - a. Nature of exports
 - 1) destination
 - 2) reflections in physical plant of port facilities
 - b. Relationship to Pinelands industries
 - c. Nature of imports
 - 1) final destination
 - 2) transport and distribution networks

- d. Ports-of-entry into the United States
4. What is the relationship to interior settlements? To address this question, information on the following topics must be collected:
 - a. Trade and communication
 - 1) evidence in artifacts
 - 2) transport system
 5. What is the impact of shipping on the regional economy and on development? Why did shipping decline? To address these questions, information on the following topics must be collected:
 - a. Impact on growth and development of regional industry and economy
 - b. Reasons for and economic effects of decline of shipping
 - c. Financing and insurance
 - d. Nature and development of associated satellite industries and services
 6. What kinds of settlements developed around ports and landings and what satellite activities occurred in them? To address these questions, information on the following topics must be collected:
 - a. Socio-economic class structure reflected in settlement
 - b. Nature of settlement pattern at shipping centers; comparison with interior settlements
 - c. Adaptation of settlements to decline of shipping
 7. What is the nature and extent of Pinelands trade as evidenced by shipping?

Commercial fishing

1. Can an evolution in fishing methods be traced and how?
2. What was the impact on the local economy?
3. What is the nature of the distribution, processing and marketing system?
4. What was the social and economic class of fishermen? How did it change over time?
5. What types of ships were used for specialized fishing? To address this question, information on production and economics must be collected.

6. What was the nature and extent of oyster farming? To address this question, information on the following topics must be collected:
 - a. Structure and operation of industry; title to oyster beds
 - b. Marketing

Navigational aids

1. How do navigational aids reflect patterns of commerce and historic navigation routes?
2. What is the evolution of the technology involved?
3. How did the system of navigational aids along the Jersey coast develop over time?

Shipwrecks

1. How are the patterns and nature of commerce reflected in shipwreck sites?
2. Do shipwrecks present evidence of shipping routes?
3. How is shipbuilding technology evidenced?
4. Bank stabilizing methods: what are the effects on the immediate environment?

There are a number of general reference sources which can and should be employed in the study of maritime related resources. Among them are:

- Archives of the New Jersey State Library
- New Jersey Historical Society
- East Jersey Proprietors
- Philadelphia Maritime Museum
- Newark Library
- University of Michigan Library (Ann Arbor)
- Library of Congress
- Rutgers University
- New York Historical Society (New York City)
- United States Coast Guard

- Ocean County Historical Society
- Mapmakers of New Jersey
- Peabody Museum (Salem, Mass.)
- Mystic Seaport (Connecticut)
- Maritime Museum of Newport News

For research into various aspects of the whaling industry, there are specific reference sources that would be enlightening. Of particular interest for evidence of ethnicity are the genealogical records of the Historical Society of Cape May Court House. Church records and municipal directories should also be examined. Architectural data may be obtained from the Historic American Buildings Survey, the Ocean County Historic Sites Inventory, the Ocean County Historical Society and Cultural and Heritage Commission, the Atlantic County Parks Commission and Preservation New Jersey. Documentation concerning mortality rates is available from church bills of mortality, municipal records, cemetery files and from burial societies. The economics and commerce of whaling is best addressed by such sources as the tax legislation of the New Jersey General Assembly, shipbuilding records and archaeological documentation of whaling related settlements. Aspects of marketing can be examined through cargo manifests, U.S. Customs files, early maps and atlases and tax and bank records as well as through archaeological means. Particular emphasis in field excavations should be placed on the identification of processing centers and dump sites and on the housing sites where the whalers resided.

Data sources for the shipbuilding industry include, for siting information, historical maps and atlases and the U.S.G.S. topographical maps. Among the more generalized sources for shipbuilding are the Cape May County Historical and Genealogical Society, the Upper Township Historical Society, In the South Jersey Boat Building Tradition: Carl Adams and the Modern Boat Works by Charles Ashton and Lauralee Rappleye-Marsett, the Survey of Cultural Resources of the Historic Era in the Watersheds of the Great Egg Harbor and Tuckahoe Rivers, prepared by R. Alan Mounier, and Glenn S. Gordiniere in New Jersey History, XCVIII(2), 1980. References for construction and procurement should not overlook possible oral history sources (especially for production of small, coastal boats) as well as records of railroads, the Philadelphia Maritime Museum, the Ocean County Historical Society, the South Street Seaport in New York City and any extant promotional materials printed for the shipyards. Municipal directories will provide information about specialization in shipyards and bank and tax records will yield economic information. Ethnicity and socio-economics can be addressed through the files of local social and fraternal organizations, shipyard ledgers and church records. Specialists who might be called upon for additional data include naval architects, maritime historians and sneakbox and garvey makers.

For information regarding shipping researchers should consult U.S.C.G.S. maps and the New Jersey and United States Census of

Manufactures to determine topographic and economic indicators for siting. Bills of lading, tax records, oral history and mill day books and records will reflect the level of commerce at upriver landings. Of particular interest would be For Want of Trade: Shipping and the New Jersey Ports 1680-1783, by James H. Levitt, Collections of the New Jersey Historical Society, vol. 17, 1981, Newark. Data about coastal shipping may be derived from the newspaper classifieds (announcing arrivals and departures), the America-China Association, Customs files (particularly those in the New York City Customs House) and tariff records, cargo manifests and harbor master records. Many of these are also good sources for the economics of shipping, as are banking and insurance company and underwriters' records. Settlement information can be gleaned from the documents of burial societies, fraternal organizations and churches, from the U.S. and New Jersey censuses and from genealogies and gazetteers.

Oral history is a particularly valuable source of information for commercial fishing since it is an ongoing practice. Trade association files and tax records may also be helpful as would an archaeological survey and investigation of coastal villages. Such a field project should concentrate on any remains of processing areas and the historic residential districts.

For navigational aids prime sources of data include U.S.C.G.S. maps, historic maps and photos and the records of the Army Corps of Engineers and the Coast Guard.

Shipwreck sites can best be documented through newspaper accounts, cargo manifests, insurance claims, salvage company records, court records of litigation and modern inventories such as Broken Spars and Shipwrecks Off The Jersey Coast. To be worthy of archaeological investigation, shipwreck sites should have as a minimum degree of integrity some evidence of the original cargo and a sufficient amount of the hull intact to determine the type of ship, its approximate date and its method of construction.

The six categories of research questions relating to specific activities can generally be answered only when data from a series of sites has been compiled and collated. To provide useful information for resolving questions in any of these categories, an individual site must at a minimum be fully recorded with regard to its physical components and natural setting. Such a recording, when combined with a close examination of historical maps and atlases, should resolve most research needs relative to siting and changes over time. Questions about ethnicity and mortality are satisfied when all the extant census entries, church records, local directories and company records have been compared with the archaeological inventory at a particular site.

Economics, marketing and commerce are broad topics that pertain to several maritime activities. Research questions in these fields are not easily soluble, if indeed they are ultimately soluble at all, from the existing record. They are addressed to the extent possible when the historical documentation referenced above - banking and insurance records, U.S. Customs files, cargo manifests, company records, etc. -

have been examined and when local satellite industries have been inventoried through municipal records and historic maps.

Some research initiatives relate to an individual category of maritime activity. Ship construction at particular sites can be documented through the archaeological record, company logs and technical reference literature. Inland and coastal shipping questions are considered resolved when all the available evidence is compiled from the archaeological record, cargo manifests, Customs files and from historical maps that indicate the location and size of upriver settlements and nearby industries. Commercial fishery processing may be partially traceable through archaeological means, but research in this area is primarily accomplished by review of the documentary evidence. The same is also true for navigational aids and shipwrecks. The research questions relating to shipwrecks may be entirely answerable through archaeological investigation, but generally only at considerable expense. Most of this information is obtainable through the sources referenced earlier and these will often suffice to address research goals.

Following is a list of individuals and events significant in the broad patterns of regional, state or national history who have been associated with Pinelands maritime activities. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS ASSOCIATED WITH
PINELANDS MARITIME ACTIVITIES

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
"Great John" Mathis	Privateer and patriarch of Pinelands family of mariners; late 17th-early 18th century	Maritime settlement property types
James Jarvis	Designed and built the first garveys in the early 1700s	
Nicholas Van Saint	Established major shipyard along the Mullica River in 1758	Shipyard property types
Lee Bros.	Operated a shipyard in Maurice River, ca. 1795; lent their name to Leesburg	Shipyard property types

SIGNIFICANT EVENTS ASSOCIATED WITH
PINELANDS MARITIME ACTIVITIES

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Ocean going vessels being built - early 1700s	Establishment of major ship- building industry with consequent economic and settlement ramifications	Shipyard property types
Battle of Chestnut Neck - 1778	National Register site; settlement and privateer center attacked by the British	Maritime settle- ment and ship- wreck property types
Development of sneakboxes - 1830s	Pinelands specific boat type developed for bay hunting	

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of individual maritime sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definition of Maritime Site

Maritime sites are defined as loci of activity which are directly associated with, or are a necessary support facility of, the fishing, shipping or shipbuilding industries in the Pinelands, a shipwreck, a navigational aid or a lifesaving station. Examples of some of these site types include the shipbuilding site in the marshes south of Dennisville, the wreck of the "Weymouth" at Mays Landing and the Barnegat Light, a National Register site.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Maritime Sites

If a cultural resource survey uncovers evidence of a maritime site, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any maritime site whose physical remnants are capable of addressing one or more of the research questions identified in the "Research Priorities" section (p. 126ff.) of this chapter or any other research

questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

- (2) Association with events significant in local, regional, state or national history (see page 137 for a partial list of significant events associated with Pinelands maritime activities):

Maritime activities were the first to draw European settlers to southern New Jersey in any numbers. Although settlement was limited mostly to the coast, the need for lumber, particularly for shipbuilding, precipitated the earliest large scale exploration of the Pinelands. Any coastal sites which relate to this initial settlement phase in south Jersey history - those involved in whaling, oyster fishing or shipbuilding - as well as inland sites which furnished the raw materials for these activities should be considered significant if they retain a high measure of physical integrity (i.e., a large proportion of the fabric from the time of their association with these initial maritime activities is intact and retrievable). Also significant are any surviving port or landing facilities, shoreline/riverbank modifications and wreck sites that reflect the former prominence of the rivers and coastline of southern New Jersey in water borne trade. Significance may further extend to the settlement features which directly supported these activities and provide evidence of the lifestyles and socio-economic status of residents.

- (3) Association with significant persons in local, regional, state or national history (see page 136 for a partial list of significant persons associated with Pinelands maritime activities):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in:

- developing the economic base for a community, the Pinelands, the state, or the nation through maritime pursuits; or

- developing ship designs, equipment, techniques or strategies which had a significant effect on Pinelands maritime activities.

(4) Significant architectural or engineering components:

Resources eligible under this criterion include buildings and structures in a maritime site that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands;
- contribute to an understanding of ethnicity or socio-economic conditions through an examination of architectural style or building type or arrangement;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- represent an adaptation to a Pinelands specific maritime activity

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that maritime sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be a maritime site with sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If a maritime site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant maritime sites. These special requirements pertain only to sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the maritime site can contribute information. If this includes any of the "Research Priorities" identified on p. 126ff., the necessary documentation may require research sufficient to establish the ethnic and socio-economic conditions that prevailed during the period that the site was in operation. Research should also define the relationship of the physical remains of the resource to economic networks and other factors important to understanding locational requirements, production, and distribution networks. The purpose of the research will be to aid in identifying the socio-cultural reflections in the artifactual record and define those factors important to the technological and economic development and operation of the maritime site that are not expected to be expressed by specific physical remains.

Furthermore, the evolution of technologies relating to shipbuilding and commercial fishing and the decline of the industry should be fully documented. Specific data on construction, operation, and management of the maritime site and the marketing of its products, if any, must be addressed in the historical research. Sufficient research must be conducted to identify all stages of the maritime activity as well as associated phenomena such as transportation systems, economics, commerce and the development of shipping routes.

- When structures, features, and equipment exist, appropriate drawings and/or photographs and written descriptions that document all aspects of the maritime

site must be prepared. A site plan that clearly defines the relationship of elements of the maritime activity involved must be prepared.

- (2) Recording requirements for significant architectural or engineering resources
- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is:
 - ° a distinctive local adaptation to a particular maritime activity;
 - ° an example of an architectural tradition associated with an ethnic group that settled in the Pinelands; or
 - ° an unusually complete example of a maritime activity in the Pinelands with its important physical features well preserved.

MINOR INDUSTRIES

General Description

The minor industries of the Pinelands comprise those sites of limited number and duration where a particular product was manufactured. Those of sufficient size to appear in the historic record entered into operation in the early 19th century and most were confined to that century. Although one of these industries, wineries, remains quite viable today, the period of study for them as a historical resource extends only into the early 20th century. Their geographical limits have been defined as coterminous with the Pinelands jurisdictional area. By definition, none of these activities has a region wide impact, but as a group they are scattered throughout the Pines and their presence is felt, at a local level, through the entire area.

Information regarding all of the minor industries is extremely limited and based on incomplete data. The Pinelands historic sites inventory, based on 19th century maps and documentary sources, is the primary base for this resource group. The inventory contains a list of minor industrial sites and general locational data, but without descriptions of the physical components or present status of the sites. For a very few of these sites there is additional data available in the form of occasional and special publications such as Paper Town of the Pines (Fowler and Herbert, 1976). These generally include a capsule history, historic photographs and sometimes a site plan. For the most part though, little is known of the physical plant of these industrial sites and virtually nothing about associated workers' housing or ancillary features. Moreover, the existing inventory cannot be relied upon to accurately reflect the entire range of minor industrial sites. Presumably, there are other mill sites within the Pines which have yet to be recorded.

With such a limited data base, it is difficult to identify significant patterns or themes remaining through this resource group and almost impossible to devise any meaningful property types. These industries did have an impact locally upon the economy and, in the case of the wine industry in the southeastern Pinelands, the impact upon population, ethnicity and settlement seems to have been considerable.

Historical Summary

In addition to the bellwether industries of the Pines - those of such celebrity or ubiquity that they are commonly associated with the region - there were always the minor industries. These represent activities which were less well known but significant in the aggregate in that, as a group, they had a measurable effect on cultural and historical patterns.

The lesser manufactories constitute a wide range of activities. Some located where they did in order to be near a necessary raw material and thus are considered Pinelands specific, but others are more

problematical in that regard. One of the larger of the minor industries for instance, the textile mills (which processed cotton), would seemingly have fared better in a more accessible area where a bigger labor force and better water power were available. Its occurrence in the Pine Barrens in the 1820s probably reflects the disjunctive nature of early industrialization in this country. Factors such as proximity to materials and market and a large, cheap labor pool only became critical in later decades when technology improved and competition increased.

The minor industries can be defined as all sites which were primarily intended to turn out a product, other than those that are treated elsewhere in this plan as separate resource groups. They are "minor" in that most are represented by only a single site whose impact on the social structure, economy and natural environment was extremely limited. Even the largest of them in terms of numbers of sites, the wine industry, was limited in its effects and areal extent to a portion of the southeastern Pinelands.

The minor industries are a mixed bag of manufacturing activities and the present inventory of them is by no means exhaustive. The ones included here are simply those that achieved sufficient size and duration, or measure of notoriety, to allow them access into the historical record. Cottage industries presumably played an important part in the Pinelands' rural past, but they are among the forms of culture not easily detected in the physical remnant. The preservation priorities for minor industries are of necessity limited to sites expressly founded and operated to produce a processed commodity.

The presently recognized minor industrial activities of the Pinelands include:

Multiple site industries -

- paper mills
- cotton mills
- wineries
- clay factories
- collier sites
- black powder (?) (Mechescatauxin Mill in Mullica; Medford)

Single site industries -

- tannery (Medford)
- turning mill (Chairville)
- chair factory (Chairville)
- toy factory (Mizpah)

The multiple site industries are the ones which made the most significant contribution to the regional economy and the cultural landscape. They are also the sites which are, for the most part, Pinelands specific, being dependent on natural resources of the area for their raw materials.

There were at least four paper mills in the Pinelands in the 19th century, all of them in the central and southern portion of the region, at Pleasant Mills (near Batsto), Harrisville, Weymouth (actually Hamilton Township) and West Creek (Dennis Township). Three of the four date to after the mid 19th century, when wood pulp first started being employed to make paper; they made obvious use of the vast pine forests that surrounded them. The mill at Harrisville however was built in 1832-1835 and used a combination of rags, rope, scrap paper and quantities of salt hay harvested from islands near the mouth of the Mullica. Paper making in the 19th century required a series of buildings to pick and clean the stock, process it into pulp and finally roll it into paper and size it (a chemical process to strengthen the bond and reduce porosity). A paper mill was in fact a complex of structures, storage buildings (to keep the highly flammable stock away from the main mill) and, of course, workers' residences and support facilities.

Textile mills would seem to be a curious feature in the Pinelands since neither cotton nor any other natural fiber was ever grown in the area. However, this is also true of the whole northeastern United States, a fact which did not prevent the region from becoming the textile manufacturing center for the entire nation throughout the 19th century. The three known cotton mills in the Pine Barrens - Retreat Factory (near Vincentown), Pleasant Mills and Atsion - were all located in or near existing iron community sites, almost certainly to take advantage of the available labor pool and support facilities. Two of the three, Retreat (founded probably in the 1820s) and Atsion (built as a paper mill ca. 1850 but never used until its conversion to textile production in 1871), apparently were intended at least partly to supplant the flagging iron works. None of these mills had any long term chance of survival, however, in competition with the huge, integrated mills of southern New England. When the factory at Atsion failed in the 1880s, the era of textile manufacture in the Pinelands came to a close.

Clay and tile factories are known in Ocean County at Wheatland (Pasadena) in Manchester Township and at the Union Clay Works in Lacey. Scattered clay pits have been found throughout this area of the Pines. There are also substantial remains of brick kilns in Mays Landing (Hamilton Township), Atlantic County. The clay works only came into existence after the railroad came through and all were located near rail lines. Their impact on the regional economy and natural landscape was relatively limited and short-lived.

Wine making has been a significant activity in the east central Pinelands for over a century. German immigrants established the industry in the Egg Harbor area in the mid 1800s and it is the only one of the minor historical industries of the Pinelands to have survived. The Renault Winery, established in Egg Harbor City in 1864, is still very much in operation today and is on the National Register of Historic Places. Although the impact of this industry was limited to a relatively small area between the lower Mullica and Egg Harbor Rivers, its consequences within that area were considerable. As a reflection of a transplanted ethnic endeavor and as an agricultural activity exploiting and altering the natural landscape, the wine industry had a measurable

effect both on the social and economic fabric and on the environment. Although it is classified as a minor industry because its influence did not extend to the entire region, wine making was, and is, a significant cultural factor within its own locale. Preservation planning in the northeastern Atlantic County area should be particularly sensitive to any remnants of this industry which could shed light on its past status or development.

Present Status

Except for wine making, all of the recognized minor industries in the Pinelands are now defunct. In fact only one structure associated with any of them is still in use, the paper mill at Pleasant Mills. This 1880 building, which occupies the site of an old cotton mill, is now the headquarters for an organization promoting cultural activities. For the most part though, remains of these industries are in a ruinous state, where there are above-ground remains at all.

This does not mean that the preservation of these sites is unimportant. Most of them will have left behind substantial foundations of the main mill and ancillary structures as well as possible sub-surface vestiges of workers' housing, privies, refuse dumps, etc. Since there is so little in the way of documentary evidence of these vanished workplaces, their archaeological remnant will provide most of the information that we will ever have of them. Although these sites are not defined as having the same regional significance as the major Pinelands industries - forges/furnaces, glasshouses, etc. - they often have much local significance. Their individual potential to yield valuable information about daily life and social patterns in the 19th century is not diminished by their being highly localized activities. Often they occupy sites originally established for one of the major industries and thus can provide comparative information on the physical culture associated with evolving workplaces.

Research Priorities

Though disparate in their physical culture, function and present state of preservation, the minor industries share some general research questions. These pertain to the relationship and interaction of the manufacturing sites to the local populace and to the natural and the built environment. Of course, there are also questions that should be formed specific to the individual industry, such as siting requirements, evolution of technology and particular localized effects. These should take shape following the literary documentation phase of a cultural resource survey.

Broad areas of research that should be addressed with regard to these sites include:

- Effects of the industrial processes on the natural environment; effects of any resource extraction operations for the industry on the environment; adaptation of the industry to the environment (modifications to processes or physical plan) and exploitation of the natural setting.

- Effects of the industry on the social structure and fabric of the surrounding community; adaptation of an established community to the industry; class distinctions, fostered by workplace, as evidenced in physical culture.
- Economic impacts of the industry on the community and region.

More specific research topics that have been identified recently by south Jersey preservationists comprise the following:

1. What are the settlement plans at minor industrial sites and how do they reflect population trends, ethnicity and socio-economic class? To address these questions, information on the following topics must be collected:
 - a. Ethnicity in the industrial population
 - 1) relationship of ethnic groups to certain industries
 - 2) reflections in the material culture and social structure
 - 3) ethnicity and social class
 - 4) successional activities of ethnic groups
 - b. Settlement patterns and intra-settlement effects
 - 1) new settlements developed around emerging industries
 - a) comparison to existing communities
 - b) community plan and relationship to mill
 - c) reflections of social class
 - 2) adaptation of existing settlements to the introduction of industry
 - a) modifications to community plan
 - b) reflections of social class
 - 3) performance of mill associated settlements
 - c. Socio-economic class and industrialization
 - 1) class distinctions, fostered by workplace, as evidenced in physical culture
 - 2) changes over time in standard of living

2. What are the siting requirements for minor industrial sites? To address this question, information on the following topics must be collected:
 - a. Environmental criteria
 - 1) proximity to power source
 - 2) proximity to exploitable resources
 - b. Economic criteria
 - 1) proximity to transportation
 - 2) access to labor force
 - 3) cost of capitalization
3. What is the physical arrangement of the mill and how does it relate to industrial functions and related sites? To address these questions, information on the following topics must be collected:
 - a. Size, form and construction of mill
 - 1) placement of various facilities
 - 2) relationship to product
 - 3) relation to size of work force
 - b. Placement of mill relative to:
 - 1) settlement plan
 - 2) transport media
 - c. Changes over time
4. What is the evidence for technology and innovation in minor industries? To address this question, information on the following topics must be collected:
 - a. Stasis and change in technology
 - b. Adoption of innovative production techniques or lag in adoption
 - c. Reflections of technological change in plan, production and economics
5. Why did the industry locate in the Pinelands? To address this question, information on the following topics must be collected:
 - a. labor

- b. capitalization
 - c. markets and marketing strategies
 - d. transportation networks and their development
6. What are the economic and environmental impacts of the industry on the region? To address this question, information on the following topics must be collected:
- a. Reflections in population and satellite activities
 - b. Exploitation and degradation of the natural environment
 - c. Effects of decline of the industry
7. What are the successional activities at former mill sites? To address these questions, information on the following topics must be collected:
- a. Identifiable patterns of successional use of sites
 - b. Economic impacts and reflections in settlement, population, etc.

Because so little is known about the nature and processes of minor industries in the Pinelands and their social, economic and environmental impacts, archaeological investigation remains a primary source of information for these activities. There are documentary sources, however, that can provide additional data. The Pinelands Commission maintains soils, vegetation, topographic, declination and hydrologic maps; other information is available from the U.S. Geological Survey and the U.S. Soil Conservation Service. Historical tax records, ratables and assessments, are available in the archives of the State Library, as are newspaper abstracts containing references from the tri-state area and New York. Other general sources available at the county or local level include title abstracts and deeds, wills and inventories, oral history, municipal histories and directories, county atlases, other historic maps and the records of the surviving industries (especially the wineries). The Hexamer surveys and Sanborn maps (beginning in 1886) may also be relevant for certain mills and the federal and state Census of Manufactures and Census of Agriculture would be generally helpful. The New Jersey Historical Society and the Historical Society of Pennsylvania will also yield useful information. More specific sources include Paper Town of the Pines by Fowler and Herbert and Braddock Rogers' articles on Pinelands industries in the American Journal of Chemical Education.

The minimum integrity characteristics required for a site to provide a reasonable amount of information are of course specific to the site and the type of industry involved. In some cases, such as wine making, the industrial process may be more effectively and less expensively recorded through documentary sources. Field investigation should be undertaken when the mill activity can be only identified through the

material culture or when there is a sufficient remnant to yield new data about technology and process. Researchers should also focus on any artifactual evidence indicative of ethnicity, socio-economic class and evolution of settlement. This evidence is available only if there are relatively undisturbed dump sites or original architectural features extant.

Questions concerning settlement, population and socio-economics should be addressed through a thorough examination of the available documentary evidence - historic maps, census files, company logs, etc. - which should then be verified and augmented by controlled excavation and recordation. When the artifactual record and the historic literature have been gathered and analyzed, then the research requirements relating to settlement and social patterns at individual sites have been met. Questions about siting, the mill plant and plan, technology and successional activities can be satisfied similarly - by means of field recording to supplement and verify the written evidence. Economic impacts are more difficult to assess at individual sites, but may be considered documented when the population and the breadth of satellite activities over time have been analyzed through census files, directories and historic maps.

Following is a list of individuals and events significant in the broad patterns of regional, state or national history who have been associated with Pinelands minor industries. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS ASSOCIATED WITH
PINELANDS MINOR INDUSTRIES

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
William McCarty	Built the first paper mill in the Pinelands 1832-1835 at McCartyville (Harrisville)	All
Harris Bros.	Took over and greatly expanded McCarty's operation in 1851	All
Daniel Loveland	Founded the original clay works at Pasadena in the mid 1800s	All

SIGNIFICANT EVENTS ASSOCIATED WITH
PINELANDS MINOR INDUSTRIES

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Establishment of mill at Retreat (Southampton) 1815	First cotton mill in the Pinelands	All
Establishment of mill at Atsion	Largest cotton mill in the Pinelands; operated about 20 years	All
Founding of Renault Winery	National Register winery founded in 1864 in Galloway Township	All

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of individual minor industrial sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definitions

Minor industrial sites are defined as physical remains of:

1. a structure or structures built specifically for the production of a processed commodity, other than a forge/furnace, glasshouse, gristmill or sawmill;
2. a structure attendant to the above;
3. the mill workers' housing and associated features; or
4. any other structures and related features that were in existence at the site when the industry was still in operation.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Minor Industrial Sites

If a cultural resource survey uncovers evidence of a minor industrial site, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any minor industrial site whose physical remnants are capable of addressing one or more of the research

questions identified in the "Research Priorities" section (p. 146ff.) of this chapter or any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

- (2) Association with events significant in local, regional, state or national history (see page 152 for a partial list of significant events associated with Pinelands minor industries):

The minor industries of the Pinelands tended to influence cultural development only over a small area, but their impact locally was often quite profound. Those industrial sites whose founding or operation caused a settlement to come into being (as at Harrisville) or provided the major economic support for a community (as did the textile mill at Atsion for a while) should be considered significant if they retain a high measure of physical integrity (i.e., a large proportion of the fabric from the time of their association with the community is intact and retrievable). Also significant are those sites which retain integrity and represent an unusual industrial adaptation to, and exploitation of, Pinelands specific conditions or natural resources.

- (3) Association with significant persons in local, regional, state or national history (see page 151 for a partial list of significant persons associated with Pinelands minor industries):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in:

- developing the economic base for a community, the Pinelands, the state, or the nation through operation of a minor industry;
- developing designs, equipment or technological innovations which had a significant effect on minor industrial activities; or

- founding an enduring minor industrial activity in the Pinelands.

(4) Significant architectural or engineering components:

Resources eligible under this criterion include buildings and structures in a minor industrial site that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands;
- contribute to an understanding of ethnicity or socio-economic conditions through an examination of architectural style or building type or arrangement;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- represent an adaptation to a Pinelands specific minor industrial activity

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that minor industrial sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be an minor industrial site with sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If a minor industrial site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant minor industrial sites. These special requirements pertain only to sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the site can contribute information. If this includes any of the "Research Priorities" identified on p. 146ff., the necessary documentation may require research into such aspects as the socio-economic conditions and ethnic configuration and population trends that prevailed during the period the mill site was in operation. Research should also define the relationship of the physical remains of the resource to economic networks and other factors important to understanding locational requirements, production, and distribution networks. The purpose of the research will be to aid in identifying the socio-cultural reflections in the artifactual record and define those factors important to the technological and economic development and operation of the minor industrial complex that are not expected to be expressed by specific physical remains. Research also should define the relationship of the mill complex and its settlement to the natural landscape insofar as possible. Specific data on construction, operation, and management of the mill and the marketing of its products must be addressed in the historical research. Sufficient research must be conducted to identify all stages of the industrial process and the evolution of the industrial community.
- When structures, features and equipment exist, appropriate drawings and/or photographs and written descriptions that document all aspects of the industrial process must be prepared. A site plan that clearly defines the relationship of elements of the industrial complex must be prepared.

(2) Recording requirements for significant architectural or engineering resources

- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is an unusually complete example of mill technology in the Pinelands with its important physical features well preserved.

SAWMILLS

General Description

Sawyerling is a specific and easily definable activity in the Pine Barrens that received its early impetus from the shipbuilding industry along the coast. Later, with increased construction and export and with the 83 consumption of 83 by the bog iron and glasshouse furnaces, the sawmills became widespread throughout the region. As such a ubiquitous activity, sawyerling is difficult to define geographically. Certainly it occurred outside the Pinelands, but as a specific response and supplier to other regional cultural activities, and as an activity which itself had a measurable effect on the regional environment, it is reasonable to study it for its particular effects within the Pines. Sawyerling has wide temporal as well as geographical boundaries. Established by the mid 17th century, sawyerling continues to this day, though as a discrete historical activity, its terminus should be fixed in the early 20th century.

Existing information for this resource group is reasonably comprehensive, but not exhaustive. Primary sources are the Pinelands historic sites inventory and a more extensive survey of sawmill sites of the Outer Coastal Plain which was recently completed under a grant from the Office of New Jersey Heritage. The Pinelands inventory contains a list of 52 sawmill sites derived from historic maps, gazetteers and documents. A majority of these are not located exactly, however, and are often referenced simply as one activity among others at a site. Most of the sawyerling sites have not been field checked, consequently descriptions are brief and their present status is unknown. Successional use, such as berry agriculture, has presumably removed the remnant of many of these sites.

The Study of Waterpowered Sawmills in the Pine Barrens of New Jersey by Alan Mounier has provided the basic text of this chapter. This survey yielded information relevant to siting requirements, association with other cultural expressions (joint milling operations, settlements, etc.), successional occupation, property types and present status. The 158 sites listed in the survey provide a sound data base but, given the remote locations where sawmills are often found and the relative lack of a remnant for later, gas-powered mills, there are likely to be many such sites that are yet undetected.

Sawmill sites are significant as early indicators of a cultural presence in the Pinelands. They can provide information about the nature and evolution of rural industry, both as a response to resource depletion and to factors of the market economy. Changes wrought upon the forest as a result of exploitation over time can be documented in part at these sites.

Historical Summary and Significance

Sawmills are among the earliest and most durable sites of historic settlement in the Pine Barrens of New Jersey. Many were established here by the first decade of the 18th century in order to secure lumber for shipbuilding, local construction and for export. Sites seem to have been selected with respect to two principal resources, viz., waterpower and timber. Although generally originating as isolated industrial stations, many sawmills became the focus of settlement and came to be associated with other aspects of industrial or commercial activity, e.g., gristmilling, fulling, etc. Sawmill sites show an interesting evolution which reflects patterns of resource use and depletion as well as the technological adaptation to changing ecological, economic, and demographic systems. Many waterpowers have been preserved as ponds or cranberry bogs even though milling has long since ceased to be practiced at these locations.

Because of their time depth and longevity as well as their connective relationship to diverse elements of historic settlement in the Pine Barrens and elsewhere, sawmill sites represent valuable resources for examining the cultural geographic development of the area through time. Also because of their importance on the landscape, such sites tend to be relatively well represented in historical publications and documents (e.g., maps, surveys, road returns, etc.). In addition, many sawmill sites are readily identifiable on the ground because of surviving structural remains and associated facilities such as dams, raceways, and ponds.

The general absence of pronounced topographic relief made the establishment of high-fall waterpowers impossible in the Pine Barrens. Nevertheless, by attending to local topographic detail and through the use of undershot wheels and, eventually, water turbines, falls sufficient for sawmilling by waterpower were obtained. An 1894 survey recorded a range in falls from 5-13 feet (average 7.7 ft.) at sawmill sites in the Pine Barrens. These mills were capable of capturing from one to thirty net horsepower which is certainly adequate to meet the requirements of most sawmilling operations.

While the topography presented problems in achieving optimum fall for milling activities, the capacity for water storage, an equally important consideration, was enhanced by the gentle relief, which constrains impoundments into broad shallow bodies of water. Mill ponds in the region range in size from a few acres to several hundred acres. Good storage capacities, coupled with reliable supply, resulted in relatively dependable, high potential power at Pine Barrens sawmill sites. Adequate power could be obtained for sustained operations during 9 months of ordinary dry years. In fact, of all New Jersey watercourses, the streams of the Pine Barrens show the greatest potential for the generation of power.

Of course, in addition to other favorable geographic characteristics, the region possessed an abundance of timber resources which were of great economic importance for lumber and fuel. Probably the most sought after wood for lumber was Atlantic white cedar, Chamaecyparis

thyoides, which occurred in expansive stands along the margins of most Pine Barrens streams. Its proximity to watercourses made its exploitation by locally situated water-driven mills a relatively simple undertaking. Because of heavy exploitation the cedar forests have been greatly reduced, in many cases largely replaced by lowland hardwood stands. In addition to the cedar, the timber on the uplands, comprising mixed stands of pine and oak, was also attractive for lumber and other uses.

The earliest sawmills utilized a reciprocating vertical frame saw which was commonplace before the introduction of circular saws ca. 1825. Motion was imparted to the saw by means of a crank attached to the horizontal shaft of the waterwheel. Cutting was achieved by directing the log in its carriage against the saw. With its teeth raked downward the frame saw would cut only on the descending stroke. The mechanism would be housed in a rough structure sufficient to protect the device and operations against the weather.

Although there were doubtless innumerable variations in the construction of sawmills, as imposed by local geographic conditions and cultural traditions, the basic device was, apparently, everywhere the same. The origin of apparatus has been traced back into the Middle Ages in Europe and Scandinavia. Sawmills of this design were used throughout the American colonies beginning with settlement in the 17th century.

It has been estimated that a man and a boy could, in ten hours, cut 4000 feet of pine lumber 15-20 feet long and one inch thick. Actual production figures for Pine Barrens sawmills have not yet come to light in this study. Potential productivity increased with the introduction of the circular saw after 1825-40, since the circular saw effectively utilized the rotary motion of the waterwheel rather than converting it to reciprocation as required in vertical frame saws.

In any case in the face of ready demand and a relatively effective extractive and processing technology, the value of prime timber resources was appreciated early on. Sustained pressure on the forest for lumber and for fuel, both for cordwood and charcoal, led to economic competition for the resource, and eventually to its degradation. At least by 1750, and probably before, the timber rights to much of the Pine Barrens forest had been purchased by individuals and private corporate concerns. As early as 1707 the General Assembly of New Jersey had adopted an act making illegal the cutting of timber under 12 inches in diameter. Subsequent legislation further regulated the cutting of timber and the export of all forest products from New Jersey.

By the 1830s the Pine Barrens forest had been completely cut over at least once and some of it twice. Repeated cutting, coupled with frequent fires and the general lack of conservation activities, had serious consequences for the quality of the forest. By 1880 New Jersey's forests had become insufficient even to meet domestic requirements, much less those related to the export trade. Also by 1880, and probably earlier, the pitch pine forest of the interior had become largely replaced by stunted growth of oak and other deciduous trees of no real economic value.

The exhaustion of commercial quality timber led to the exploitation of logs buried in swamps, particularly in upper Cape May County where the mining of cedar logs for shingles became a well developed enterprise in the 19th century.

A number of other cultural responses to the depletion of the forest can be seen in the study of sawmills in the Pine Barrens. The distribution of sawmills through time suggests that, from the middle of the 19th century on, sawmills moved to marginal waterpowers near stands of marketable timber. This suggests a conscious compromise of optimum hydraulic conditions in favor of proximity to exploitable raw materials.

Beginning about the third quarter of the 19th century water-driven mills were succeeded by engine-driven mills, powered either by steam or by internal combustion engines. Since these mills had no dependence upon the energy of falling water, they required no water control facilities and could be set up on a temporary basis in remote locations near commercially valuable stands of timber where waterpower could not be secured. In addition to their mobility such mills had the advantage of being able to operate year round irrespective of freezing conditions, flood, or drought which rendered water-driven mills useless.

By 1875 or somewhat before, there appears to have been a shift from bulk commercial production to custom cutting at retail by local resident sawyers. By sawing lumber to order from timber stock provided by the customer, sawyers could enjoy the benefits of a permanent facility established at a good waterpower without the need to locate near a source of timber. Income was produced not by bulk sales of lumber but by providing custom milling services. Payment may have been in cash or in kind. Such facilities were most likely to spring up at or near settlements with adequate transportation and sufficient population to require such services. Mills so situated were likely to diversify into other related activities such as gristmilling. The situation at a permanent facility probably encouraged the investment in capital improvements, e.g., the construction of a more durable physical plant, the installation of high efficiency turbines, diversification into other milling activities, etc., which would have represented worthless (or at least ill-advised) expenditures under more tenuous conditions. Custom mills appear to have survived in a number of locations throughout the Pine Barrens well into the present century. One example is the mill on Stephen's Creek, near Estellville.

It would appear that as early as 1850 economic pressures brought on by local forest depletion and possibly by competition from importations (the timing coincides with the period of commercial lumbering in Pennsylvania) began to make wholesale sawmilling unprofitable in the Pine Barrens. One response to this pressure was the abandonment of milling in the Pine Barrens entirely. In many other cases though, early sawmill sites were converted to cranberry culture, thus capitalizing upon existing investments by shifting from power generation to the water regulation required for cranberry production. The battery ponds created for the sawmills proved to be ideal reservoirs and bogs for the emerging cranberry industry. In fact, a full 40% of the known sawmill sites in the Pine Barrens were eventually converted to cranberry production.

Many sites also became associated with other milling operations, such as gristgrinding, flouring, cranberry cleaning, paper and textile manufacture, iron working, wood lathing and finishing, and bagging. About 45% of sawmill sites were involved at one time or another in joint milling operations.

Frequently the seats of joint waterpowers became the focus of settlement. The rise of continuous settlement appears to have involved more than the mere presence of a sawmill or a favorable millseat. Communities which developed in association with waterpower appear to share a number of common characteristics, viz., 1) location upon a stream at the head of tide or at the head of navigation; 2) favorable location with respect to surface transportation; 3) favorable location with respect to raw materials needed for extractive or processing industries; and 4) sufficient population for labor needs and to maintain the physical and social integrity of the community. Few of the sawmill sites of the Pines, however, ever rose to such prominence. Most were isolated and relatively ephemeral, their operators moving on when the local stands were exhausted. Some of the mills of course were fairly substantial and remained active for a long time. Most disappeared into the landscape though, leaving behind perhaps a pond, a vestigial surface remnant and an invaluable archaeological record of natural resource use and exploitation in the Pinelands over the course of centuries.

Elements of a Sawmill Site and the Milling Process

Waterpower for sawing and other operations is dependent upon certain characteristics of the natural and cultural environments. Chief among these are 1) a reliable water supply; 2) topographic features sufficient to allow for the elevation and storage of a body of water; 3) proximity to an economically exploitable raw material; and, 4) economical routes of access linking the extracted or processed material and its destination.

The Pine Barrens offered generally favorable conditions for the establishment and maintenance of water-driven sawmills, especially with respect to water supply and storage and to the presence of an abundant extractable resource. Due to characteristics of the landscape, transportation posed certain difficulties which in any case proved not to be insurmountable.

Even in periods of drought the Pine Barrens streams provide a usable, if not commodious, dry season flow, mostly from the release of groundwater from saturated sediments and spongy lowlands which border the streams. Conversely, the capacity of the soils and the swampy expanses to absorb heavy precipitation after dry periods results in moderate flows. This last accounts for the long-term survival of unreinforced earthen dams and other water control facilities which would be rapidly destroyed in high energy floods experienced in other areas.

Many sawmills were erected during the early 18th century and some may even date to the end of the preceding century. Generally the impression is that early mills were situated so as to exploit a favorable waterpower in proximity to a high quality timber reserve. This

situation gave rise to the appearance of early sawmills in remote locations in the interior.

At the early mills nearby trees were cut into manageable lengths on the ground and transported by teams of draft animals to the sawmill where lumber of chosen dimensions was cut. The length of the lumber produced was limited by the fixed length of the log carriages on early mills, generally not in excess of twenty feet. This size restriction facilitated the handling of both logs and cut lumber; even the largest logs could be easily handled by one or two men. Since the terrain is generally without pronounced relief, logs could be transported short distances overland without much difficulty, especially during winter when the ground was frozen and snow covered.

The early mills appear to have been inefficient devices which captured little power from shallow heads of water. Because of topographic limitations most of these sites had effective heights of fall of well under ten feet and in many cases five feet or less. This situation led to the construction of mills at least partially upon artificial supports (e.g., on pilings in the lowland or upon the crest of an earthen dam). The timber mill foundations were commonly erected in the bed of a stream immediately downstream from the outlet to the pond. Only rarely were overshot wheels used in the Pinelands; it is likely that most of the early mills utilized undershot wheels which are better suited to low-head situations. The motion of the wheel would be regulated by controlling the flow of water through a sluice by means of a lever or screw actuated flood gate. The inlet to the sluice would have been protected by a gridwork which prevented sticks and other floating debris from entering, and potentially, fouling the wheel. A platform on the upland or upon the dam may have been added to facilitate the loading of logs to be cut and the removal of finished lumber.

In general the following property types are detectable at the sites, both bulk commercial mills and custom mills, inspected thus far: 1) ponds; 2) dams; 3) raceways; 4) millwheel and mill; 5) sawyer's dwelling; and 6) road system.

1. Ponds: Ponds and formerly impounded areas of drainage basins are obvious physical features which indicate the presence or former existence of a waterpower. Impoundments created for industrial or economic uses quite naturally conformed to the details of local topography. Because of the low and level terrain over most of the region, mill ponds in the Pine Barrens tended to be relatively broad, long, and shallow.
2. Dams: Except where they have been improved in recent times, all of the recorded dams associated with Pine Barrens sawmills were simple earthen constructions, comprising little more than elongated sand and gravel ridges erected across stream bottoms to elevations sufficient to permit the creation of a useful head of water. None of these dams appears to have incorporated any substantial internal structure (e.g., log cribbing or rock core), even though such construction features were specified in early millwrights' manuals. The only structural

elements in the dam were the flood gates and trash racks. These were necessary to control water flow to the millwheel and to protect the wheel from being damaged by floating debris. In construction of these dams local materials were most commonly employed. This is amply demonstrated by the presence of borrow pits upon the upland adjacent to locations where the ends of the dams abut the fast ground.

3. Raceways: Ideally, water-driven mills would be situated a short distance downstream from the impoundment, with water for power directed to the mill wheel through a channel, commonly referred to as a raceway. However, virtually all of the mill locations identified in the Pinelands showed little or no separation between the mill site itself and the dam, thus generally eliminating the presence of a head race. More obvious than headraces were tailraces which are simply ditches through which water travelled after leaving the mill to rejoin the parent stream.
4. Millwheel and Mill: The millwheel was commonly located directly adjacent to the mill building, which in most cases was little more than a rough shelter for the log carriage and the sawyers. Foundations and plank flooring would have been more substantial generally than the superstructure, presumably to absorb vibration from the saw and to protect against differential settlement. Later mills employed water turbines rather than wheels and some switched to steam power and finally to combustion engines. These latter were free of dependence upon a water source and tended to be temporary, leaving behind no permanent trace.
5. Sawyer's Dwelling: Dwellings are found only at better established sites.
6. Road System: This occasionally included corduroy roads, pavements of logs laid across a path in low areas that would be otherwise impassable.

In addition, engine driven mills may be classified separately as a seventh property type. Introduced in the second half of the 19th century, these mills could be assembled and disassembled with relative ease and did not require an elaborate hydropower system. Consequently, they tend to leave little physical trace.

Present Status

Several factors have been identified as modifiers of the physical characteristics and conditions of sawmill sites. These factors can be grouped into the following classes: 1) abandonment and decay; 2) modernization; 3) reuse; 4) transportation improvements; and, 5) other. In many instances the mills were abandoned after the period of profitable operation had passed. Structural materials may have been pirated from abandoned mills for reuse elsewhere or the buildings simply left to decay through neglect.

Many other sites show evidence of at least episodic modernization in improvements to the physical plant (e.g., replacement of timber with masonry foundations, substitution of turbines for wooden wheels, etc.). The mills at Estellville (Atlantic County) and Tuckerton (Ocean County) provide examples of early sites subjected to subsequent alterations for purposes of modernization.

A related factor is reuse either through augmented use of the waterpower (e.g., incorporation of gristmilling addition to sawing) or through adaptation to non-power functions (e.g., water control for cranberry culture). In most cases the effect has been the near total destruction of the earlier mill structures (exclusive of earthen embankments).

Improvements to transportation facilities (roads and bridges) associated with mill locations has, in the past, resulted in the degradation or outright obliteration of mill remnants. Bridge reconstruction programs throughout the region in the 1930s and later has led to the obliteration of numerous mill sites. Two examples are Hand's Mill on West Creek (Cumberland County) and Johnson's Mill on Dennis Creek (Cape May County).

Other modifications to mill sites have resulted from stream dredging (for canalization, insect control, etc.). The loss of Christopher Mills (Burlington County) may be at least partially attributed to this cause. Vandalism to mill remains is probably another source of resource degradation, but very little information about this factor has come to light.

Of the six property types identified at water powered sawmill sites, the best preserved today are the most substantial, the ponds and dams. The landscape of the Pine Barrens is today dotted with battery ponds, many of which originally powered sawmills. A large number of the dams have been altered for various reasons, but a reasonable sample remains in the more isolated areas. Tailraces, which were rudimentary in their construction, also survive, though many have silted in or are grown over. Unfortunately, no intact examples of original floodgates or trash racks are known to exist.

A significant number of sawmill sites have been found to contain surficial remains of the mill, though in only one case, Batsto, has the superstructure survived (the Batsto mill is an 1880's reconstruction of the 1857 original). Wood pilings, wooden or masonry foundations and timber planking comprise the visible evidence, though the sub-surface remnant should be substantial in a large number of cases. Vestiges of waterwheels and turbines are also rare at the surface but are likely to be found underground and under the stream beds.

Attendant structures and facilities have left far less of a surface trace than the mills themselves. Possible cellar holes are known at a few sites and many of the old sand roads are still in existence. However, as is the case with the mill buildings, a significant

archaeological expression of these ancillary features can be expected at less disturbed sites.

Research Priorities

Of the 158 sawmill sites represented in the current sample a total of 36 have been found to contain some apparent surficial physical remains. These sites represent the reservoir from which information about the past with respect to sawmilling (and related phenomena) can be most readily drawn. Other sites with less obvious archaeological representations may also prove to be of great importance in this respect.

The general historical assessment and interpretation of sawmill sites have progressed to the point that additional general research is likely to be redundant. In order to advance the state of knowledge about sawmills it will be necessary to examine selected sites, singly and in the aggregate, by a comprehensive and integrated program of documentary research, oral history, and archaeological investigation.

Future research with respect to sawmills should attempt to describe and interpret sawmill sites holistically in terms of the cultural-geographic systems of which they formed a part. The analysis of such systems might progress from the identification and interpretation of component parts. With respect to sawmills, the major components include: 1) a water resource; 2) a timber resource; 3) a milling technology; 4) an economic demand; 5) a transportation network; 6) a work force; and 7) a related pattern of settlement. Each of these components both influenced and was influenced by the other elements of the system, by the operation of the system itself, and by other modifying factors. Isolating and explaining the structure and function of such a system should be the principal thrust of future research into sawmilling in the Pine Barrens. In other words, further investigations should be directed toward achieving an anthropological synthesis rather than an historical-particularistic recounting of sites on a piecemeal basis.

A number of specific issues may be raised which would help shed light on the individual components of a sawmill site. These relate to the following categories of research:

1. What are the siting requirements for sawmills? How do these criteria differ for water power mills, engine driven mills and custom mills? What are the regional distribution patterns for the various types of sawmills? To address these questions, information on the following topics must be collected:
 - a. Criteria for choice of site
 - 1) hydraulic considerations
 - 2) forest conditions
 - 3) ownership of land
 - 4) economic criteria
 - a) proximity to market

- b) demand for particular product
 - b. Evaluation of relationship of hydropower sources to available sources of wood
2. How are engineering and technology evidenced at sawmill sites? How did the technology evolve? To address these questions, information on the following topics must be addressed:
- a. Adaptation of hydropower installations to low head sources
 - b. Relative efficiency of the technology employed relative to other regions and industries
 - c. Evolution of the technology over time
 - 1) reciprocating vs. rotary saw
 - 2) adoption of newer methods such as turbines
 - 3) effects on the industry

Literary and documentary sources specific to most of these research questions are available locally. For topics relating to engineering and technology, researchers should consult Vermeule's 1894 waterpower survey, the Risdien and Boyden companies' 19th century catalogues of water wheels and turbines, the U.S. Patent Office and the Army Corps of Engineers, USGS topographical quadrangle maps, historical county atlases and other local maps, L. Hunter's Waterpower in the Age of Steam, the bog iron furnace day books, glass company records, oral history (including the American Folklife Center, Library of Congress records) and local and county historical organizations. To yield useful information for these questions, a sawmill site must have left some structural remnant intact, such as a subaqueous or subterranean foundation or pilings. Elements of the dam or battery pond will provide data concerning the amount of available head and horsepower. Other specialists who would be helpful include industrial archaeologists and members of the Society for the History of Technology.

3. What are the effects of sawyering on the natural environment? How are these effects evidenced both locally and regionally? To address these questions, information on the following topics must be addressed:
- a. Impact of damming and ponding on existing species and on the creation of new habitat conditions
 - b. Patterns of resource procurement and depletion
 - c. Successional growth patterns
 - d. Extent of areas affected by individual sawmills

Many of the above sources will also aid in documenting impacts of sawyering on the natural environment. Additional references include the New Jersey Department of Environmental Protection, Division of Forestry,

USGS bulletins, the New Jersey Agricultural Society and the Pinelands Commission's Comprehensive Management Plan, which contains a list of source works on native species of the Pines. Botanists, paleobotanists, limnologists and experts in sedimentology could aid in resolving questions of environmental impacts and should be consulted.

4. What are the economic factors that influenced sawmill production? How did sawyering affect the local economy and how did it relate to the wider economic network? To address these questions, information on the following topics must be collected:
 - a. Contribution to the regional economy and to employment
 - b. Patterns of resource selection, processing and distribution for market
 - c. Specialization for particular markets
 - d. Causes of the consolidation and eventual decline of sawyering as an economic activity
 - e. Joint milling activities (especially with gristmills)
5. What is the pattern of successional economic activities at former sawmill sites?

The economics of sawyering is best addressed through such documentary sources as cargo manifests, deeds, wills and inventories, census records, municipal directories and the records of the New Jersey and Pennsylvania Historical Societies.

To provide data regarding economics, a site must at a minimum be able to yield evidence of the type of wood being cut and the length of time the mill was in operation. Economic historians and cultural geographers can aid in researching these questions.

Basic data which should be recorded to the extent possible in any field investigation includes:

1. date of construction (perhaps available from road returns, survey records or tax records)
2. Span of continuity
3. Hydropower installation
 - a. Type of wheel/turbine
 - b. Battery Pond
 - c. Gate Mechanism
 - d. Dam

- e. Raceways
- 4. Nature of product
- 5. Type of saw and dimensions of mill structure
- 6. Cultural remnants associated with the sawmill (structural and artifactual)

The four basic areas of research involving sawyering - siting criteria, technology, economics and effects on the natural environment - are satisfactorily addressed for the most part when the natural and cultural resources in and around a site have been fully recorded. Controlled excavation, extraction of core samples and architectural description should be combined with examination of relevant literature - natural resource inventories, soils and vegetation maps, USGS quads, hydrologic studies, historic maps and directories, etc. - to provide the basic data necessary to answer these research questions. Additional information relating to technology may be available in the form of period equipment catalogues and these should be consulted.

Following is a list of individuals and events significant in the broad patterns of regional, state or national history that have been associated with Pinelands sawyering activities. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS ASSOCIATED WITH
PINELANDS SAWMILLS

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
Abraham Waier	Leader of separatist Rogerine Baptists who settled in Waretown in 1762; operated a sawmill there in the 1760s	All water driven types
Randall Marshall	Prominent as founder of Marshallville in 1810, a glasshouse community in Upper Twp; operated sawmill in Upper Twp.	All water driven types
John Collier	Proprietor of sawmill whence village developed (1834)	All water driven types
William Corlies	Member of extended Pinelands family (Corlisstown, now Warren Grove) who operated a sawmill in 1765	All water driven types
Zebulon Webb	Member of extended Pinelands family (Webbtown) who operated Webbs Mill prior to 1774	All water driven types
Mathew Steelman	Member of extended Pinelands family (Steelmantown) who operated Griscom Mill	All water driven types
Gideon Scull	Member of extended Pinelands family (Scullville, Sculltown) who operated Griscom Mill with Mathew Steelman	All water driven types
M.M. Chew	Member of extended Pinelands family (Chewville) who operated Coles Mill in 1856	All water driven types

SIGNIFICANT EVENTS ASSOCIATED WITH
PINELANDS SAWMILLS

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Initial large scale sawyering in the Pines interior (late 17th-early 18th centuries)	Provided lumber for shipbuilding and thus promoted settlement of coast; caused first significant exploration of Pines and beginnings of a cultural infrastructure	All water driven sawmill types
Introduction of circular saw (1825-1840)	By better utilizing hydraulic torque, significantly increased sawmill production capacity	All water driven types
Introduction of engine driven mills (third quarter of 19th century)	Allowed development of movable mills and thus greater access to timber sources	Engine driven mills
Appearance of custom mills (third quarter of 19th century)	Stationary mills, no longer tied to lumber source, now located near population centers; indicative of change in economic basis of sawyering	All types
Exploitation of buried logs in cedar swamps (latter 19th century)	Provided major contribution to local economies, particularly in Cape May County	All types
Succession of cranberry cultivation at former sawmill sites (latter 19th century)	Examples of re-use of the culturally modified environment; indication of a gradual shift in the region's economic base from rural industry to agriculture	All water driven types

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of individual sawmill sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definition of a Sawmill Site

A sawmill site is defined as a locus of activity where sawyering took place in the past, including features such as:

- any structural remnant of the mill itself;
- components of the mill's hydropower systems (penstock, millwheel or turbine, any gearing, shafting or belting for the transmission of power, wheelpit, tailrace);
- vestiges of the sawyer's residence or ancillary structures; or
- the surrounding area of artifactual scatter and milling debitage

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Sawmill Sites

If a cultural resource survey uncovers evidence of a sawmill site, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any sawmill site whose physical remnants are capable of addressing one or more of the research questions

identified in the "Research Priorities" section (p. 166ff.) of this chapter or any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

- (2) Association with events significant in local, regional, state or national history (see page 171 for a partial list of significant events associated with Pinelands sawmills):

Sawyering is an activity which involved the earliest large scale exploration and exploitation of the Pinelands interior. While contributing significantly to the regional economy and supplying the raw material necessary for several other industries, sawmills also had a profound effect on the natural environment. Those sawmills which are examples of the introduction of a new technology (such as the circular saw or the engine driven mill) or a response to market shifts (such as custom mills) should be considered significant if they retain a high measure of physical integrity (i.e., a large proportion of the fabric from the significant aspect of the sawmill is intact and retrievable). Also potentially significant are mills which retain integrity and continue to present graphic evidence of the effects on the natural environment or which were operated specifically to service another Pinelands resource group, especially if it is associated with a resource that is itself considered significant.

- (3) Association with significant persons in local, regional, state or national history (see page 170 for a partial list of significant persons associated with Pinelands sawmills):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in:

- developing the economic base for a community, the Pinelands, the state, or the nation through sawyering; or

- the field of sawmill related engineering technology in the Pinelands, the state, or the nation.
- (4) Significant architectural or engineering components:

Resources eligible under this criterion include buildings and structures in a sawmill complex that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands;
- contribute to an understanding of ethnicity or socio-economic conditions through an examination of architectural style or building type or arrangement;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- represent an adaptation to a Pinelands specific sawyering activity

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that sawmill sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be a sawmill site with sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If a sawmill site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter V), there are special recordation requirements that apply only to Pinelands Designated and significant sawmill sites. These special requirements pertain only to sawmill sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the sawmill site can contribute information. If this includes any of the "Research Priorities" identified on p. 166ff., the necessary documentation may require research into such aspects as the relationship of the physical remains of the resource to economic networks and other factors important to understanding locational requirements, production and distribution networks. The purpose of the research will be to define those factors important to the technological and economic development and operation of the sawmill complex that are not expected to be expressed by specific physical remains. Research also should define the relationship of a sawmill complex to the timber resources and the natural landscape insofar as possible. Specific data on construction, operation, and management of the sawmill and the marketing of its products must be addressed in the historical research. Sufficient research must be conducted to identify all stages of the sawyering process.
- When structures, features, and equipment exist, appropriate drawings and/or photographs and written descriptions that document all aspects of the sawyering process, including those related to conversion for alternative uses, must be prepared. A site plan that clearly defines the relationship of elements of the sawyering process must be prepared.

(2) Recording requirements for significant architectural or engineering resources

- An outline (for buildings) or narrative (for engineering resources) format written description and history of the

building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is an unusually complete example of a sawmill related technology in the Pinelands with its important physical features well preserved.

SETTLEMENTS

General Description

Settlements, which are residential areas of communal rather than isolated form, occur from different time periods and in relation to different cultural and environmental factors. Though settlement in the Pine Barrens interior did not begin on any scale until the 18th century, the time frame for the study of this phenomenon extends into the latter 1600s. It was in the later 17th century that settlements began to appear along the coast and along the western fringes of the Pines in the more fertile Inner Coastal Plain. The geographical limits of this resource group extend well beyond the Pinelands, of course. However, the formation of the settlements of the Pine Barrens is a response to its unique natural environment and to cultural factors also specific to the region. As such they form a definable resource group unto themselves that is worthy of individual attention.

Existing information on the historic development of Pinelands settlements is not great. The sources used, the Pinelands Commission's historic sites inventory, local histories, gazetteers and Beck's Forgotten Towns of South Jersey, are spotty at best in their recording of material culture and the relationship of that historic remnant to early functions and activities. Among these sources there is no unifying approach and biases in favor of various types of information - fables and anecdotes, historic personages, municipal and social organizations, etc. - are common. It is also likely that some of the very small, early settlements within the Pinelands interior have been entirely overlooked.

The most effective approach to the study of these settlements is through the identification of settlement types, relating predominant functions to the physical remnant of those functions. Various settlement types have been recognized in the Pines and, with this basis, the development of regional settlement patterns and the evolution of settlements as a reflection of economics and technology can be better documented.

Historical Summary

Settlement in the Pinelands on anything approaching even a moderate scale did not begin until well into the 18th century. The Dutch and the Swedes, particularly the Dutch, were the first colonizers of New Jersey in the early 17th century, but they were more interested in trade than in widespread settlement. In 1629, the Dutch West Indies Company did attempt to entice colonists into populating the Hudson Valley and New Jersey by offering generous land grants, but this effort was limited almost entirely to north Jersey and even there met with little success. Further south, the Swedes began to build a series of forts up the Delaware River in the 1630s and 1640s, but were expelled in 1655 by the Dutch, who wished to dominate the lucrative Indian trade themselves. It has been estimated that there were only about 200 Europeans in New

Jersey in 1664 when England seized the colony from the Netherlands, and these settlers were mostly in the area around Bergen.

Almost immediately after the English gained sovereignty, efforts at widespread settlement of New Jersey increased dramatically. Colonists from New England and Long Island flooded the territory and small towns began to dot north Jersey and agriculturally desirable areas to the south. By 1700, the north was well settled, as was a broad strip along the Delaware River from Trenton south to the Delaware Bay. There was also some sporadic settlement along the south Jersey coast, but the interior, including the Pinelands, was still almost entirely unpopulated.

Thus the Pinelands resisted development into the 1700s and in fact did not see its first great influx of peoples until the third quarter of the century, when the bog iron industry took hold. The production of bog iron precipitated the first of the two major periods of population growth in the Pinelands. The other occurred almost a century later when the railroads came through the Pines in the 1850s and later. These constitute the two most significant and recognizable growth periods in the Pinelands cultural development, one just after the mid 18th century and the other just after the mid 19th century.

Prior to what might be called the "iron rush" of the 1760s and later (the increase in population brought on by ironworking should not be overemphasized; it probably was not great initially), growth in settlement was slow and tied to the minimal agriculture and resource exploitation being carried out. A majority of the settlements founded in the Pine Barrens from the late 17th century through the middle decades of the 18th were simply tiny clusters of housing grouped around a millseat (either a sawmill or gristmill) or a tavern. Others were mainly riverboat landings and roadside communities and these were all scattered about the Pines.

The development of the bog iron industry in the 1760s produced the first major period of growth and settlement in the Pinelands. A labor intensive activity, the bog iron forges and furnaces spawned communities of several hundred people each and encouraged the growth of other settlements that served the industry and the burgeoning population. The forges and furnaces needed fuel. This led to increased exploitation of Pinelands forests. The shipbuilding industry and river landing settlements thrived with the flourishing bog iron trade.

In the first half of the nineteenth century, glassmaking joined bog iron as an important Pinelands industry, especially in the west central portion of the Pinelands. Glass and bog iron manufacturing brought an industrial base and relatively large settlements and satellite communities to underpopulated areas.

The iron furnace and forge settlements were short lived, generally lasting from thirty to ninety years. Glassmaking settlements were longer lived and provided a stabilizing influence when the bog iron industry began its terminal decline in the 1840s. Glassmaking in the Pinelands endured until the early twentieth century. Minor industries

often reinvigorated early industrial sites and settlements throughout the nineteenth and early twentieth centuries.

Along with resource exploitation, transportation routes were an important determinant of settlement. Settlements along transportation routes have a different and more varied history, physical form and present status than settlements primarily based on resource exploitation. Eighteenth and early nineteenth century transportation based settlements in the Pinelands were located along navigable rivers or overland routes.

Maritime and riverine settlements usually had a combined industrial/commercial base. River routes were the most important transportation routes through most of the Pinelands until the mid-nineteenth century and spawned numerous settlements. Abundant forests along navigable rivers led to a booming shipbuilding industry and promoted commercial shipping. River landing settlements exported wood products, iron, glass, and agricultural produce. In maritime settlements along the bays, clamming, oystering, fishing, and shipbuilding were important activities. Port Elizabeth, Dennisville, Port Republic, Mays Landing, Green Bank, New Gretna, Tuckerton, and Wading River were all maritime or riverine settlements.

Overland settlements include stagecoach or tavern settlements along old roads through the Pinelands and crossroads settlements, at the junction of two or more roads. These settlements generally were smaller than the maritime and riverine settlements. They usually had a dominant commercial outlet such as a stagecoach stop or tavern, a small grouping of houses, and possibly a church. Blue Anchor is an example of an eighteenth century tavern settlement; Cross Keys is a crossroads settlement. A number of stagecoach and crossroads settlements were also small industrial settlements. Some crossroads settlements, like Medford, located in an agricultural/industrial area where overland routes predominated over river routes, grew into larger settlements.

The railroads came through the Pinelands in the 1850s and 1860s and brought about a second major period of growth. The location of new settlements was determined by the railroad. The continued viability of old settlements was also related to proximity to rail lines. The two major rail lines were west/east lines from Philadelphia to the Jersey coast resort towns of Cape May and Atlantic City. They cut through the Pinelands south of the Mullica River. The less populated northern and central Pinelands had only one railroad, a north-south line.

The railroad encouraged the development of a new economic base--fruit and vegetable farming and berrying--at a time when the Pinelands major industry, bog iron, was dying. The railroads took Pinelands products to major markets. In the southern Pinelands, they brought new railroad-generated settlement and new life to older settlements. Old river communities, like Tuckahoe and Mays Landing, and old industrial communities enjoyed new prosperity with the coming of the railroad.

By the end of the nineteenth century, the relatively sparse settlement of the Pinelands led to a new type of settlement, the planned community. Pinelands planned communities were made possible by cheap land, good rail transportation, and proximity to major cities. These planned communities share characteristics of the early resource exploitation settlements or transportation settlements. Some were built as planned agricultural or industrial communities, making use of Pinelands natural resources for new types of agriculture such as berry production or industry. Many late nineteenth century planned communities were on railroad lines, but unlike the rather spontaneous growth of railroad settlements, the planned community is characterized by a singular vision -- a community dedicated to a specific purpose or created for a particular ethnic or religious group.

Planned communities were built in the Pinelands during the late nineteenth and early twentieth centuries. Like the earlier nineteenth century settlements that preceded them, some planned communities were completely new settlements; others transformed earlier settlements. Many speculative real estate ventures and planned communities were paper dreams that failed to materialize. Others had only a very brief life. Still others evolved in ways not envisioned by their planners and developers.

Settlement Types

For the purposes of this study, "settlement" is not a term synonymous with "township" or "city," which are legal entities with specific boundaries and large open space. In fact, most towns in the Pinelands include several settlements. A settlement is a clustering of people and residences (and often workplaces and commercial ventures) in a roughly contiguous group, the shape and formation of which is related, at least initially, to the factors which caused its founding. A settlement is essentially whatever is perceived as such by the people of its time; it looks inward upon itself to form an identifiable sense of "place." A settlement has boundaries, but they are not officially prescribed; its boundaries are defined simply by the outer limits of the built or cleared environment and by the shared perception of what constitutes its areal extent.

A number of different kinds of settlements have been recognized in the Pinelands, based on whatever social, economic or environmental factors led to their founding. The factors which caused these communities to come into being can in turn be grouped into three basic categories, those which are:

- resource exploitation related,
- transit related, and
- cohesive group related.

Settlement types which are related to resource exploitation owe their existence to a Pinelands natural resource which was used in some

way to support the local economy. Of the various types of settlement which have been recognized in the Pinelands, those which fall into this category include:

- milltowns (especially bog iron and glasshouse settlements),
- agricultural settlements,
- resorts, and
- speculative real estate ventures.

The milltowns and agricultural communities occurred much earlier and in larger numbers than the resorts and the settlements that resulted from organized real estate promotions; most of the latter developed only after the railroad came through. The former are also more characteristic of Pinelands indigenous activities and have had a more profound and lasting effect on the local culture.

Transit related settlements are those founded nearby, and focusing upon, a major transportation route, be it road, rail or water. The settlement types within this category are:

- crossroad settlements,
- railroad settlements,
- stagecoach settlements,
- tavern settlements, and
- maritime settlements.

Development patterns within these settlement types can be strikingly different - a maritime town like Mays Landing bears little physical resemblance to a crossroads community such as Archer's Corner - generally because the functional relationship of the settlement to the transit route is different. The crossroads, stagecoach and tavern settlements tended to follow one development pattern - a small grouping of structures centering on a single dominant commercial outlet catering to transients as well as locals - which may be called "transit related/local service" settlements. Railroad and maritime communities followed an altogether different pattern - considerably larger sites that served as collection centers for local goods that were to be shipped to market - which may be termed "transit related/regional commerce" settlements. With the relatively large pool of workers and excellent transport facilities available, these sites naturally attracted industry, sometimes evolving into mill towns by the early 20th century.

The cohesive group related category includes two types of settlement, ethnic and religious communities. The two overlap to a large degree in that most of the ethnic settlements represent groups of people of a single religious heritage whose communities strongly reflect that heritage. Ethnic settlements are largely a late phenomenon in the

Pinelands, occurring mostly in the late 19th and earlier 20th centuries, though the German settlements at Egg Harbor City and New Germany (now Folsom) date to the 1850s. Religious settlements occurred both early and late, though not many have retained any denominational flavor. A large majority of these sites, especially the earlier ones, are simply settlements that grew around an early church to which most of the residents belonged. Only a few represent groups of dissenters, zealots or refugees who consciously set out to create a community apart from the mainstream where they could practice their own brand of worship. Most of these, such as Rova Farms, Mount Misery and Keswick Grove, are quite late, dating to the end of the 19th or the 20th century.

Irrespective of the settlement type, certain common building types are likely to occur in many, if not most, of the settlements of the Pines. These include:

Houses - Houses were and usually still are the predominant building type in all types of Pinelands settlements. Both traditional and vernacular houses (described in the subchapter on Residential Architecture) are found in various states of original preservation.

Churches - A church is often a key or landmark building in architectural character and the social and religious history of the settlement. Churches in Pinelands settlements today generally date from the mid to late nineteenth century and represent vernacular Greek Revival, Italianate, Gothic Revival, or Victorian Gothic styles. The Pinelands Designated Mays Landing Presbyterian Church is unusual in its vernacular Jeffersonian Classical design on the exterior and Greek Revival on the interior. Churches are generally in a closer-to-original state of preservation than many of the houses and other building types in settlements.

Taverns and Inns - Taverns and inns, which share similar characteristics, can be found in many settlements along transportation routes. They are often similar in appearance to traditional and vernacular houses. This is not surprising as many were used as both commercial and residential buildings. Inns which accommodated overnight travelers tend to be larger. Some taverns and inns, like the churches, have a key or landmark presence in both visual character and historic significance. Taverns and inns have survived in various states of preservation. Refer to the subchapter on residential architecture for further analysis of these residential type buildings.

Stores - Like taverns and inns, many stores in the Pinelands served as both commercial and residential buildings and are similar to houses in the region. Beginning in the Victorian era, large plate glass "storefront" windows distinguish the storefront from other residential/commercial buildings. Stores vary widely in size and state of preservation. Wood buildings with gable, mansard, or boomtown roofs predominate in rural areas. More urban areas feature masonry buildings in the vernacular Italianate style of the second half of the nineteenth century or the vernacular commercial modes of the twentieth century. As is typical of these buildings, the first story storefront is more subject to alteration than the upper stories.

Schools - Some of the larger settlements have schools dating from the early twentieth century which constitutes a distinctive schoolhouse type. They are generally simple buildings, one or two stories, with a hipped or gable roof, and groupings of multi-paned windows. Some have simple classical detailing. They are rarely of architectural significance, but may have a landmark presence in their communities and may have historic significance. Nineteenth century one-room schoolhouses may survive in adaptive use as residences with alterations and additions that would compromise their integrity as a schoolhouse.

Present Status

It is difficult, if not impossible, to determine the total number of settlements that have existed in the Pinelands. However, a broad spectrum of the settlement types discussed above still remain and there is certainly an archaeological remnant of the full range of types scattered about the Pines.

For purposes of preservation planning it is important to distinguish principally between inhabited and abandoned sites. Planning for the two must take into account the problems as well as the opportunities posed by each. Abandoned settlements represent sealed time capsules, unencumbered by recent overlay, the "pure" past. Such sites often possess great archaeological potential. The main problem with them, especially for any remaining architectural features, is decay and disintegration. The emphasis in their preservation effort should be on the stabilization, or at least the careful recordation, of the above-ground elements and the safeguarding of archaeological remains until they can be properly studied.

Inhabited sites on the other hand are dynamic examples of the continuing evolution and adaptation of settlement patterns that has been ongoing for 300 years. The alarum in these cases is that this evolutionary process will obliterate evidence of the original causes for settlement or of an earlier evolution precipitated by economic, technological or social factors. The preservation focus here should not be on attempting to arrest the natural evolution, but on integrating the historic elements intact into the process.

Research Priorities

The overriding concern that dictates the focus of research and preservation involves discerning, through the historical record:

- the original cause for a settlement's founding (settlement type),
- shifts over time of the original settlement type, and
- physical evidence of both the settlement type and the later historic shifts.

Once the nature of an individual settlement and its evolution are clear, the research questions that relate it to other settlements and to Pinelands culture in general can be explored. The priorities for

preservation are determined principally by the ability of the historical remnant of a settlement to answer recognized research questions. Priorities can also be derived from the desire to retain elements of the local heritage for public education and edification.

The major research questions regarding Pinelands settlements relate to the following subjects:

- What are the siting requirements for the various settlement types?
- What factors led to the founding of a settlement and its resulting form and physical characteristics? What changes occurred over time and why?
- Socio-economic classes: Where did each class tend to locate within settlements and which classes prevailed in different settlement types? How does their physical culture compare?
- Town plans representing different periods and settlement types: How do planned settlements compare with those which underwent spontaneous growth?
- What is the relationship between settlements and local and regional transportation systems?
- What was the physical response (expansion and contraction) of settlements reacting to regional or national economic factors?
- How do indigenous vs. exotic forms and materials in evidence at various settlements compare?
- What is the evidence for ethnicity in settlement plans and forms?
- Exploitation of and adaptation to natural resources: What are the effects of settlements upon the local and regional ecology?

Data sources for Pinelands settlements include the Pinelands Commission's Pinelands Villages and Towns: Historic Area Delineations, Henry C. Beck's Forgotten Towns of Southern New Jersey and More Forgotten Towns of Southern New Jersey, John McPhee's The Pine Barrens, Place Names of Ocean County, New Jersey, by Vivian Zinkin, Charles S. Boyer's Early Forges and Furnaces in New Jersey, South Jersey Magazine, South Jersey, A History, edited by Alfred M. Heston, and the several county and regional surveys underwritten by the United States Department of the Interior Historic Preservation Fund, administered by ONJH. These include the New Jersey Historic Sites Inventory, Ocean County, the Burlington County Survey and Inventory of Historic, Architectural and Cultural Resources, and the Survey of Cultural Resources of the Historic Era in the Watersheds of the Great Egg Harbor and Tuckahoe Rivers.

There are also many histories of specific towns and settlements compiled by consultants and local historical societies. Some of these are A

History of Monroe Township, The Medford Lakes Story, An Old Jersey Furnace (a brief history of the settlement at Martha), Built in a Compact Manner (Medford Village), Historical Architectural Survey and Preservation Planning Project, Village of Whitesbog, Cultural Resources Survey (Evesham), Egg Harbor City Centennial, Paper Town of the Pine Barrens (Harrisville), and The Story of Hammonton. Contact the municipality or ONJH for copies. Historic county maps and atlases and 19th and early 20th century insurance maps (Miller and Sanborn) can provide extremely valuable information on the growth of settlements. These are available at the State Library.

Following is a list of sites significant in the broad patterns of regional, state or national history who have been associated with Pine-lands settlements. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS ASSOCIATED WITH
PINELANDS SETTLEMENTS

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
George May	Founded Mays Landing in 1740s; ran store and tavern	All
Charles Landis	Founder of Landisville and Vineland in mid to late 19th century	All
Abraham Waier	Religious Leader; founder of Waretown in 18th century	All
Charles Read	Iron magnate; founder of Batsto, Atsion, Aetna (Medford Lakes) and Taunton furnaces	All
William Holman	Prominent landowner in Jackson Twp. in mid 19th century; founded Holmansville as a Presbyterian church and settlement	All
Richards family	Influential iron and glass family in 18th and 19th centuries; prominent in numerous settlements	All
John Estell	Glass manufacturer; responsible for founding of Estellville in Estell Manor	All
John Dennis	Prominent landowner in 17th century; influential in founding Dennis Twp. settlements	All
Joseph Wharton	Industrialist who purchased "Wharton Tract" in 1870s; influential in numerous Pinelands settlements	All
J.J. White	Founded Whitesbog in latter 19th century; developed cranberry culture	All

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
Abraham Brown	Mill operator in early 19th century; responsible for founding Browns Mills	All
Leon Todd	Real estate developer responsible for founding of Medford Lakes in 1920s	All
William McCarty	Founded paper mill in 1832 that grew into McCartyville (Harrisville)	All

SIGNIFICANT EVENTS ASSOCIATED WITH
PINELANDS SETTLEMENTS*

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Founding of Woodbine	Center of the South Jersey Jewish poultry and agricultural farmstead areas that developed in the latter 19th and early 20th centuries	Ethnic and agricultural settlements
Founding of Medford Lakes	Log cabin construction; 20th century resort and suburban settlement development	Resorts/real estate ventures
Founding of Amatol/ Belcoville	Short lived World War I ammunition complexes	Minor industries
Founding of Mays Landing	Successful upriver port, shipbuilding and commercial center and county seat	Maritime settlements
Founding of Tuckerton	Major maritime settlement in the 18th century and Port of Entry for the United States	Maritime settlements
Founding of Batsto	Best preserved iron settlement	Milltown
Founding of Estellville	Well preserved (archaeologically) glass settlement	Milltown
Founding of Harrisville	Well preserved (archaeologically) minor industrial settlement	Milltown
Founding of Medford	Well preserved agricultural bog iron and commercial settlement; good historic housing stock	Various
Founding of Cassville	19th century crossroads settlement transformed by Russian Orthodox immigrants in the 1930s	Religious settlements

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Founding of Tuckahoe/Corbin City	Well preserved shipbuilding settlement influenced by the coming of the railroad in the 1860s	Maritime and railroad
Founding of Washington	18th century peripheral iron settlement with a tavern used as a Revolutionary War recruiting center; presumably well preserved archaeologically	Milltown
Founding of Mt. Misery	CCC camp from the 1930s later turned into a religious center	Religious settlements

*This list is a representative sample of settlements which were founded or evolved to serve major cultural activities of the Pinelands.

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of individual settlement sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definitions

Settlement - A clustering of structures, including at least two residential structures, perceived at one time in the public mind as a "place" or community, as evidenced usually by the bestowal of a generally recognized place name.

Settlement type - The major reason which prompted a settlement to come into existence, as evidenced in the physical attributes relating to its original primary function, economic underpinning or ethnic configuration.

Evolution of settlement type - A significant change in the primary function, economic underpinning or ethnic configuration of a settlement.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Settlement Sites

If a cultural resource survey uncovers evidence of a settlement site, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any settlement site whose physical remnants are capable of addressing one or more of the research questions identified in the "Research Priorities" section (p. 183ff.) of this chapter or any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

- (2) Association with events significant in local, regional, state or national history (see pp. 188-189 for a partial list of significant events associated with Pinelands settlements):

Settlements are generally the most accurate barometer of culture within a region and usually are the primary instrument of cultural change and evolution. Those sites in a settlement that relate directly to the settlement type or an evolution in settlement type should be considered significant if they retain a high measure of physical integrity (i.e., a large proportion of the fabric from the time they helped define the settlement type or affected the evolution in type is intact and retrievable). Also significant are those planned communities whose plans still reflect the ethnic heritage or social vision of their founders.

- (3) Association with significant persons in local, regional, state or national history (see pp. 186-187 for a partial list of significant persons associated with Pinelands settlements):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual who made a significant contribution to the cultural or political history of the region or was responsible for notable achievements in:

- developing the economic base for a community, the Pinelands, the state, or the nation; or
- establishing a Pinelands settlement or causing a change in settlement type.

- (4) Significant architectural or engineering components:

Resources eligible under this criterion include buildings and structures in a settlement that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands;
- contribute to an understanding of ethnicity or socio-economic conditions through an examination of architectural style or building type or arrangement;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- represent an adaptation to a Pinelands specific activity

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that settlement sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be a settlement site with sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If a settlement site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant resources within settlements. These special requirements pertain only to sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the site can contribute information. If this includes any of the "Research Priorities" identified on p. 183ff., the necessary documentation may require research into such aspects as the relationship of the resource to economic networks and other factors important to understanding locational requirements, settlement type and any evolution of settlement type. Additional research should be pursued to provide information regarding the socio-economic and ethnic heritage of the settlement. The purpose of the research will be to define those factors important to the economic development and operation of the settlement that are not expected to be expressed by specific physical remains.

The research should also result in information on planned vs. unplanned settlements. Specific data on the relationship of the resource to the settlement type must be addressed in the historical research as well.

- When structures, features and equipment exist, appropriate drawings and/or photographs and written descriptions that document all agricultural operations, must be prepared. A site plan that clearly defines the relationship of the site to the settlement of which it is a part must be prepared.

(2) Recording requirements for significant architectural or engineering resources

- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is an unusually complete example of a resource reflecting the settlement type or an evolution in settlement type, with its important physical features well preserved.

TRANSPORTATION ROUTES AND RAILROADS

General Description

The road systems, railroads and navigable waterways of the Pinelands are the resources that permitted physical communication among the people of the Pines and their centers of cultural activity. They appear with the earliest permanent settlement in the region and mirror the course of development over time. Though the railroads begin only in the 1850s, earlier forms of transportation routes date to the early 18th century. With the advent of the automobile, new transit patterns developed which ushered in the modern age of communication. Geographically, this resource group is certainly not bounded by the natural or the jurisdictional borders of the Pinelands, but research may reasonably be limited to its influences here as a discrete social sub-region.

Historic maps and the Pinelands historic sites inventory provide the basic data for this resource group. However, all the available historic maps have not been inventoried and thus the existing record has serious omissions and is biased toward the major road systems and railroad trunk lines, at the expense of feeder and connector roads and railroad spur lines. A more systematic and comprehensive approach which clearly enunciates the chronological development of transit routes in the Pines would yield more useful data.

Even with the deficiencies of the present information base, some patterns and events relating to historic transportation facilities are evident. Several major road systems dating to the early 18th century are known. They are recognizable as the main corridors along which much early settlement occurred and should be the focus of further research into early settlement patterns. Other, lesser road systems were spawned by other of the Pinelands resource groups, linking the major facilities with shipping areas, associated peripheral sites and satellite settlements. Iron forges, for instance, caused their own network of roads to come into being and many of these roads (mostly sand roads) are still in existence.

The coming of the railroads in 1854 created an entirely new settlement pattern in the Pines. Perhaps no other single event had such a dramatic effect on the cultural map of the region. The stations built during these early years are often excellent examples of vernacular Victorian architecture. Some of these stations were identified and evaluated as part of a comprehensive thematic railroad station survey and National Register nomination undertaken by New Jersey Transit and available from the Office of New Jersey Heritage. The one operating station evaluated as significant in the Pinelands and listed on the State and National Registers and Pinelands Designated is the Tuckahoe Railroad Station. Now vacant, efforts to adaptively use the building should be a priority before further deterioration precludes preservation.

There are probably few other extant historic railroad stations in the Pinelands Area. Any that are found should be evaluated within the

historic context and integrity standards developed in the state's Thematic Railroad Station Survey.

Automobile-generated commercial buildings and structures have been a vital part of major roadways of the Pinelands for most of the twentieth century. This includes farm markets, gas stations, roadhouses, motor courts, and restaurants. Unlike the commercial buildings of the stagecoach and railroad eras, these buildings tend to be spread out along roadways rather than clustered in settlements.

Car culture buildings and structures in the Pinelands, as in other areas, are often short-lived. Changing fashion in diner and gas station design subjects many of those buildings to radical alteration. Popular roadhouses are enlarged while less popular ones disappear. An original motor court, such as Abbott's Modern Cabins, is a rare survivor of a type of overnight lodging popular from the 1920s to the 1950s. Ironically, the farm markets, with their temporary looking buildings and stands, are the one type of thriving and well preserved roadside enterprise.

Although few of these buildings and structures are likely to be Pinelands Designation eligible because of their age or loss of integrity, they add to the character of the Pinelands and should not be overlooked in historic architectural surveys.

Historical Summary

Knowledge of historic transportation routes is integral to an understanding of the settlement/development patterns of New Jersey. The distribution of the population within the early colony was strongly influenced by geographic factors, and principal among these was the location of navigable streams. In an age when land transportation was truly laborious, water routes were particularly important. New Jersey was blessed in having a great many navigable creeks and rivers draining into the Delaware and the Atlantic.

Though the use of the natural water systems was the only practicable way of transporting commodities, people preferred to do their travelling by land. Land travel, however, was arduous in the extreme and travellers were never satisfied with road conditions. The early roads were community efforts, built and maintained by local labor and supervised by township overseers. These roads were poor and problems with them abounded. Drainage along many of them was bad and the road surface was usually rutted and pockmarked. Water crossings were another obstacle which entailed either unpredictable delays waiting for ferriage or risky fordings of streams.

Beginning fairly early in the 19th century, New Jerseyans were afforded an alternative means of transit more comfortable than roads and more convenient than rivers - the railroad. New Jersey found its beginnings early in railroading. While Great Britain's George Stephenson designed, in 1814, the first primitive model of the steam locomotive, New Jersey already had an ardent fighter for a rail system in a distinguished Revolutionary War veteran - Colonel John Stevens.

Stevens, as early as 1811, sought a charter, from the New Jersey Legislature, to construct a steam powered railroad. He was not only known for his military record, but for his successful experiments with steam engines as well. At about the same time that George Stephenson was working in England on his locomotive, John Stevens was criss-crossing the state making the first railroad survey. The following year, on February 6, 1815, he got his New Jersey charter, first in the United States, and in 1825 he built the country's first locomotive and ran it around a circular track at Hoboken. He called it simply the "Steam Wagon."

Not until 1831 did an actual railroad start operations in New Jersey - it was the third in the country. For all his struggles, Colonel Stevens was not even involved in this company. However, his son, Robert, was an active member on the Board of Directors of the new enterprise, the Camden and Amboy Railroad and Transportation Company. When Colonel Stevens, died in 1839, at the age of 89, railroads were just beginning to honeycomb the state.

From these early beginnings, railroads soon assumed an important role in the development of New Jersey - as well as the rest of the nation. The coming of the "Steam Wagon" was to play an important part in the socio-economic revolution that followed. This new mode of overland transportation transformed everything in its path. The railroad had a sort of "Midas touch," with the ability to change a once struggling settlement into a thriving boom town overnight. One such example of this boom town effect could be seen in the impact of one early railroad - The Camden and Atlantic. This railroad crossed through the Pinelands, connecting Camden with Atlantic City and transforming that city almost overnight into a major resort community.

These early railroads not only brought commerce to the region but also served Pinelands industries by providing a faster and more efficient means of exporting finished goods. The Pines became more accessible to people and industry.

The effects of the introduction of the railroads on the Pinelands were profound and lasting. With the first tracks laid through the area in 1854, a new order of economic, industrial, and settlement patterning had begun. Native industries such as lumber, agriculture, glass making and sawyering were now able to export products overland cheaply and expeditiously. After the mid 19th century, the location of new settlements was determined primarily by proximity to rail lines. The gradual decline of other established settlements was in part attributable to their distance from rail routes. The map of the Pinelands was much changed in 1900 from what it had been in 1850, and this was due in large measure to the coming of the railroads.

Elements of a Transportation Site

Transportation sites can be divided into three basic categories - waterways, roadways and railroads. The waterways of the Pinelands are natural transit routes that have been little altered by man. The major modifications to them historically involved dredging and filling for

harbors and bank stabilization efforts. Bank stabilizing was often accomplished by driving old ships up against the shore, a practice that has presumably left behind an invaluable archaeological remnant. Although they are essentially a natural phenomenon, the navigable rivers and the coastline of the Pines were and are a major determinant of culture. They have long played an important role in the social and economic evolution of the region and were instrumental in the development of settlements based on commerce. Historically significant property types of such a waterway site would include:

- navigable water route
- bank stabilizers
- docking or landing facilities.

Roadways had a similar but more widespread effect on the cultural structure of the Pine Barrens, linking established towns and opening up new areas for settlement. These roads were usually built and maintained by local labor, so their quality and durability varied from place to place.

The property types associated with road sites area as follows:

- road bed
- toll stations
- bridges, fording places, ferry slips, mill dams, or any other facility used to cross water or other expanses
- stagecoach stops (station, inn, tavern, etc.).

Railroad sites can be divided into a variety of categories, depending on their function and size. They can range from nothing more than a lone water tank to a whole complex of buildings and towers.

The following property types constitute a railroad site either individually or in any combination of elements:

- terminal/station building/shelter and platform
- bridges
- freight house
- section house
- trackage and R.O.W./junctions/crossings
- engine water tank
- signal tower
- turntable

Present Status

Except for some degree of siltation which has made them broader and shallower, the navigable water routes of the Pinelands have remained essentially unchanged since historic times. Cultural features associated with them should probably be fairly well preserved since many have remained fully immersed and encased in muck.

Roadways of course have undergone a much greater transformation, though perhaps not as great in the Pines as elsewhere. The relative stagnation of the region economically and in terms of population has resulted in a paucity of public works projects, including road work. Thus, many of the old sand roads in the area are still intact and even the major thru routes, which have long since been paved, have at least retained much of their original alignment.

Throughout southern New Jersey, hundreds of miles of track were laid and operated between 1831 and the present. Along these tracks, numerous facilities, both large and small, were constructed. A large number of these facilities have disappeared without a trace, primarily because of either neglect or salvage of the materials for reuse.

The anticipated present status of the elements of a railroad site is as follows:

- Terminal - many are still standing throughout the Pinelands, though often in a deteriorated state
- Freight House - the same as the terminal. In many locales, old, abandoned box cars were used in lieu of freight houses.
- Section House - the same as the terminal
- Engine Water Tank - perhaps an archaeological expression remains
- Turntable - the same as the terminal, especially if it was contained within a roundhouse
- Signal Tower - the same as the terminal
- Movable Bridge - an excellent chance of being found intact; if not, the pilings may be extant
- Junction or Crossing - conceivably left intact; if not intact, a possibility of a concentration of the road bed material.

Research Priorities

Transportation routes can only be understood and evaluated in relation to the sites which they served. The physical elements of a transit system itself generally have only limited research value, though a few features, such as bridges, may have significance as engineering

landmarks. Knowledge of the original alignment of a transit route may also help in locating the remains of taverns and other roadside sites. But the real value in recording these routes lies in establishing their impact on extended patterns of settlement, communications and commerce.

Most of the research questions below address a particular transit medium, be it a road, railroad or waterway, though some deal with the interrelationships among them or more generally with the impact of evolving communications on the Pinelands. The types of questions that need to be resolved relate to topics such as:

1. What are the major transportation routes historically? To address this question, information on the following topics must be collected:
 - a. Changes over time:
 - 1) increases and decreases in volume of traffic
 - 2) changes in use patterns and nature of cargo
 - b. Transit "watersheds:" identification of road networks focusing upon a major route
 - 1) origin and purpose of feeder routes
 - 2) growth and changes to the dendritic pattern
 - c. Technological changes that had an effect on the operation and use of different transit media
2. What are the effects of transportation routes on the natural environment? To address this question, information on the following topics must be collected:
 - a. Direct effects:
 - 1) changes in localized habitat due to damming
 - 2) dredging and channeling of waterways
 - b. Indirect effects:
 - 1) coastal development prompted by greater access
 - 2) landscape changes wrought by increased resource exploitation and agriculture
3. Cultural mapping: what are the new settlements, sites or activities that came into being along a transit route or as a result of one? What are the changes in existing sites caused by the introduction or improvement of an access route? To address these questions, information on the following topics must be collected:
 - a. A diversification or an increase in the population
 - b. The impact on lifestyle and standard of living as evidenced by the artifactual remnant

- c. Changes in building type or density throughout the settlement
 - d. Changes in land use patterns in the general vicinity, such as:
 - 1) an increase or change in agriculture or resource exploitation
 - 2) abandonment of more remote locales in favor of proximity to the transit route
4. What are the effects on the native industrial base? To address this question, information on the following topics must be collected:
- a. New industries attributable to the introduction of railroads or other transit media
 - 1) type of industry and relationship to the natural environment
 - 2) impact on regional economy and standard of living
 - b. Changes to existing industrial base and communication network
 - 1) growth or decline of industries because of relative proximity to the transit line
 - 2) industry as a catalyst for transport route development
 - 3) tracking of spur lines to connect industries and major truck lines

Data sources for research into transportation routes and railroads are many and diverse, though unfortunately also widely scattered. To determine the major transit routes at various times in Pinelands history, researchers should consult Landsat and other aerial photos, gazetteers, historical maps and atlases, road returns, railroad records such as timetables and survey maps (some of these records are in Penn Station, New York City), tariff records, the Interstate Commerce Commission, files of the New Jersey Department of Transportation and county highway departments, the Army Corps of Engineers, the Civil Aeronautics Board and the Federal Aviation Administration, USGS and Soil Conservation Service maps, Princeton University (Richard Halliburton map collection), Yale University department of transportation, the Henry Ford Museum, the Smithsonian Institute, popular railroad publications such as Railway Age and Railroad Gazette, tax records (for exempted land) and the American Railroad Association. The minimum integrity characteristics a site must possess to yield useful information involve a sufficient archaeological expression to securely establish its date and function. The original routing of a road system must also be detectable if it is to aid in research. The allied specialists who would be most helpful in identifying major transit systems would be historical geographers.

The effects on the natural environment which can be traced to evolving transportation routes relate primarily to resource exploitation networks. These include sand and gravel mining, marl and clay extraction, tourism and agriculture. Sources for these operations are railroad records, records of existing companies, the Rutgers University Extension Service, the U.S. Department of Agriculture and the Interstate Commerce Commission. Property types best able to address this question are principally those archaeological and architectural features that are indicative of resource storage or extraction, especially those in close proximity to the transit route. Specialists who might provide useful research data include botanists and other natural scientists.

Changes to settlements and settlement patterns are best documented through archaeological means. Additional information sources include the state and federal censuses, the records of unions, churches and social organizations, bills of mortality, historical atlases, court records, political party files, municipal histories and local historical societies, the state and federal departments of labor, newspapers (classified ads soliciting laborers and announcing timetables), genealogies and local school board records. The property types most suitable for addressing questions of population density and diversity within settlements are the housing areas and their associated outbuildings, privies or other dump sites. Other settlement related questions will require examination of depots and loading stations served by the transit route and surviving elements of the downtown commercial district. Cultural geographers and socio-linguists should be called upon to aid in researching these topics.

Documentary sources for the impact of transit systems on Pinelands industry include, in addition to some of the references already mentioned, company records, local chambers of commerce, the state and federal census of manufactures, tax records, community directories, the Wheaton Museum library, the Corning Museum, iron furnace day books and bank records. To provide useful information, sites to be investigated should possess at minimum a sufficient archaeological expression to identify a manufacturing or processing center near a transit route and sufficient evidence (archaeological or documentary) to confirm the relationship between the route and the industry. Specialists to be consulted regarding impacts on industry include cultural geographers, economic and technological historians and industrial archaeologists.

The research questions relating to transportation systems can for the most part be adequately resolved at individual sites through a detailed examination of the historic and contemporary records mentioned above. Identification of transport routes is accomplished through a comparison of historic maps and atlases from different periods and from newspaper accounts and public records indicating changes in use. An inventory of roadside facilities deduced from historic maps and surveys would complete the documentation for this question. Natural resource inventories, U.S. Army Corps of Engineer reports, USGS quadrangle maps and a sequence of historic maps should suffice to answer questions about effects on natural environment. This effort may be supplemented by soil borings to determine former vegetation patterns.

Changes to settlement patterns and economic activities can be satisfactorily documented through historic maps and census and tax records. When the shifts in land use patterns, population and the location of settlements has been fully recorded, these research objectives may be considered met. The effects on the native industrial base are again documented by historic maps, tax records and the census of manufactures. Changes to pre-existing industries attributable to new transit routes may be more difficult to establish. The use of such documentation as company records and road returns, supplemented by archaeological investigation where appropriate, will provide sufficient data to address this issue.

Following is a list of individuals and events significant in the broad patterns of regional, state or national history who have been associated with Pinelands transportation networks. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT PERSONS ASSOCIATED WITH
 PINELANDS TRANSPORTATION NETWORKS

<u>Person</u>	<u>Significance</u>	<u>Property Types Affected</u>
Andrew K. Hay	Glasshouse operator who was instrumental in building the property types Atlantic City Railroad in the 3rd quarter of the 19th century	All railroad property types
Benjamin Jones	Iron magnate who built the Columbus, Kinkora and Springfield Railroad in the 2nd quarter of the 19th century to ship iron products to market	All railroad property types

SIGNIFICANT EVENTS ASSOCIATED WITH
PINELANDS TRANSPORTATION NETWORKS

<u>Event</u>	<u>Significance</u>	<u>Property Types Affected</u>
Founding of Camden and Atlantic Railroad - 1854	First railroad through the Pinelands	All railroad property types and railroad settlement property types
Construction of cloverleaf entry/exit ramps connecting Rtes. 50 and 322 in Hamilton Twp. - 1931	First use of this standard highway design	Roadways

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. EVALUATION

The following sections set forth the methods to evaluate the qualities and the integrity of sites relating to individual transportation routes and railroads in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definitions

1. Historic transportation route - An historic roadway, waterway or railroad site.
2. Historic roadway - A paved or unpaved road between settlements of the Pinelands used for commerce at least 50 years ago.
3. Historic waterway - Navigable waterways of the Pinelands used for commerce at least 50 years ago.
4. Historic railroad site - Railroad installations which are located in settlements (as defined in the settlement resource group) whose type or evolution in type is directly attributable to the railroad's presence; also, a railroad "yard" and all the installations which would normally be associated with it including, but not limited to, turntables/roundhouses, repair barns, equipment barns and switchhouses.
5. Essential elements - Bridges, ferry slips, toll houses or any other structures 50 or more years of age built specifically for the operation of an historic roadway; docks, landings, bank stabilizing devices or any other structure 50 or more years of age built specifically for the operation of an historic waterway; physical evidence or remains of any structure built specifically for the railroad 50 or more years ago, which was meant to serve an historic railroad site. Specifically excluded from this definition are trackage, sidings, grade level crossings and road bed materials.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Historic Transportation Routes

If a cultural resource survey uncovers evidence of an historic transportation route, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any historic transportation route whose physical remnants are capable of addressing one or more of the research questions identified in the "Research Priorities" section (p. 198ff.) of this chapter or any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

(2) Association with events significant in local, regional, state or national history (see page 204 for a partial list of significant events associated with Pinelands transportation routes):

Transportation routes are an instrument by which culture is conveyed. They reflect existing settlement patterns and create new ones. Those routes which retain a high measure of physical integrity (i.e., essentially the same alignment as well as a large proportion of the fabric from the time of their construction) should be considered significant if they are a very early reflection of a technological innovation in transportation or if they created a new pattern of settlement, commerce or industry in the Pinelands. Also potentially significant are those routes built specifically to serve another Pinelands resource group, especially if it is directly related to a resource of that group which is itself considered significant.

- (3) Association with significant persons in local, regional, state or national history (see page 203 for a partial list of significant persons associated with historic Pinelands transportation routes):

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in:

- developing the economic base for a community, the Pinelands, the state, or the nation through construction of a historic transportation route;
- developing a technological advance or strategies that had an effect on transportation systems; or
- developing the railroad system in New Jersey.

- (4) Significant architectural or engineering components:

Resources eligible under this criterion include essential elements of a historic transportation route that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate the vernacular building traditions of the Pinelands;
- contribute to an understanding of ethnicity or socio-economic conditions through an examination of architectural style or building type or arrangement;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- represent an adaptation to a Pinelands specific resource group.

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance

must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that historic transportation routes which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to be a historic transportation route with sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If a historic transportation route is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant historic transportation routes. These special requirements pertain only to the essential elements of historic transportation routes that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the transportation route can contribute information. If this includes any of the "Research Priorities" identified on p. 198ff., the necessary documentation may require research into such aspects as the relationship of the physical remains of the resource to economic networks and other factors important to understanding locational requirements and settlement patterns and the production and distribution networks of

Pinelands products. Research relating to technological innovations should also be conducted and information on the impacts of these routes upon local communities collected. The purpose of the research will be to define those factors important to understanding the economic development and impacts upon Pinelands settlements and industries that are not expected to be expressed by physical remains. Additionally, specific data on regional economic effects of the transportation route, if any, must be addressed in the historical research. Association of any resource with events of the American Revolution should be fully documented as should any impacts on the natural environment. Sufficient research must be conducted to identify all phases of the development and evolution of the transportation site.

- When structures, features, and equipment exist, appropriate drawings and/or photographs and written descriptions must be prepared that document all aspects of the essential elements. A site plan that clearly defines the relationship of elements of the transportation related activity must be prepared.
- (2) Recording requirements for significant architectural or engineering resources
- An outline (for buildings) or narrative (for engineering resources) format written description and history of the building or engineering feature, photographic documentation and minimal graphic documentation will be required if the resource is an unusually complete example of a transportation site in the Pinelands with its important physical features well preserved.

RESIDENTIAL ARCHITECTURE

Historical Summary

The New Jersey Pinelands has a variety of house types and styles that were built and have survived from the eighteenth through the early twentieth centuries. These houses reflect the building traditions of the cultural groups who settled the Pinelands. Traditional Pinelands houses are based on traditional English houses, reflecting the predominant background of the earliest settlers of the Pinelands. These traditional English building practices had already been modified by the building material available and by environmental conditions the settlers found where they first landed, in New England, New York, and Pennsylvania. Pinelands residential architecture reveals the influence of Delaware Valley, New England, and Long Island traditions. The materials and environmental conditions of the Pinelands led to further adaptations and preferences for particular building types. These traditional house types are not unique to the Pinelands. Most can be found throughout south and central New Jersey and some can be found in areas throughout the Northeast.

In traditional or folk buildings, building forms and skills are passed from one generation to another and local building materials are used. Traditional building is conservative and unaffected by changing architectural styles. The floor plan is of primary importance in identifying a traditional building type; dimensions and window and door placement are secondary identifying characteristics.

Traditional houses in the Pinelands tend to be simple and small. The earliest traditional houses were probably one and one half stories, and related to the British Cabin or British medieval Hall and Parlor House (Type 1). A few examples can be found today scattered along eighteenth century roads. Most that exist today have been incorporated into nineteenth century houses.

Certain traditional building types became especially popular in the Pinelands and continued to be built well into the nineteenth century. The typical traditional house in the Pinelands is a two to two and one-half story wood house, sheathed in clapboard, one room deep with a gable roof, interior end chimney, and entrance on the eaves elevation. The number of bays and the door placement distinguish one type from another (Types 2, 3, 4), but these types share similar characteristics of form and plan. Other traditional houses appear to have similar facades with a two or three room plan (Type 5). Their small size, narrow depth, and two to two and one-half story height give these houses a strong vertical character. These types may reflect seventeenth century London or urban influences rather than rural influences. The Center Door House is the most popular traditional house type and can be found throughout the Pinelands.

Traditional Pinelands houses tend to have rather symmetrical facades. A bit of symmetry seems to have crept into these houses without the other components of Georgian classicism, the separate circulation hall and classical detailing. Those houses with

asymmetrical window and door placement do not seem to be earlier than the more symmetrical houses. Some asymmetry is found, particularly on door placement on the South Jersey Side Door House (Type 4).

In the nineteenth century, while traditional houses were being built, houses revealing a succession of new architectural styles also were built in the Pinelands. The new styles were not the high style architecture found in centers of wealth, fashion, and sophistication. Instead, vernacular adaptations of high style residential architecture were built in the Pinelands. These vernacular houses had a new floor plan, typically based upon the Georgian style center hall plan or side hall plan. They incorporated architectural details and proportions associated with a particular style, albeit in a simplified fashion.

Vernacular houses from the late eighteenth through the mid nineteenth century were influenced by Georgian classicism, like other vernacular houses of the period in New Jersey. The Georgian style is differentiated from traditional residential architecture by the inclusion of a separate circulation hall and architectural details influenced by Classical (ancient Greek, Roman, or Renaissance) architecture. The full Georgian style house is a two and one-half story, five bay building, two rooms deep, with a center hall (Type 6). A two-thirds Georgian House is a two and one-half story, three bay house, two rooms deep, with a side hall (Type 7). The New Jersey Georgian ususally has interior end chimneys and a gable roof. By the beginning of the nineteenth century, the Georgian gave way to the more refined Federal style, which in turn evolved into the more robust Greek Revival in the second quarter of the nineteenth century. The Federal and Greek Revival houses had different proportions and architectural details, but retained the basic Georgian plans -- the five bay, center hall plan and the three bay side hall plan.

Center and side hall plan houses became very popular in New Jersey, often supplanting the traditional house types by the beginning of the nineteenth century or creating hybrid traditional/Georgian/Federal houses. In South Jersey and the Pinelands, vernacular adaptations of Georgian, Federal, or Greek Revival houses can be found, often built with the plain detailing that typified traditional building in the area. Thus, although many center and side hall plan houses were built, the architectural detailing that usually characterized these styles tended to be absent or greatly simplified. Transoms, sidelights, fanlights, door enframements, columns, pilasters, moulded window trim, classical roof cornices and other architectural details characterizing these styles are not found as frequently on Georgian plan houses in the Pinelands, as in many other areas of New Jersey, where high style influences were stronger.

Some traditional and vernacular houses can be found throughout the Pinelands; others are mostly found in certain areas. The Delaware Valley Georgian/Federal influence is prevalent in coastal and inland villages and the brick farmhouses of western Burlington County. Coastal areas also reveal New England and Long Island influence in Georgian/Federal clapboard houses. The Cape Cod House -- a one and one

half story wood house with central entrance, two rooms wide and two rooms deep -- is rarely found.

Basic traditional and vernacular forms were combined to form extended houses (Type 8). As is typical in New Jersey houses, many houses in the Pinelands have been extended laterally. Others have rear ells. Unlike the typical New Jersey fashion for a slightly recessed side wing attached to a main block, extended houses in the Pinelands tend to have a flush facade. The two sections may be the same height and width, or different heights and widths. The dating of the various parts of an extended house should be examined on a case by case basis. The small wing is not necessarily the earliest section. Some extended houses were probably built all at once and do not necessarily represent sections added over time.

The "I" House is a house type of English origin found in the Pinelands that may have aspects of traditional or vernacular design. The "I" House is a two story house, one room deep, two or more rooms in length. It may take the form of two or more traditional houses strung together lengthwise, like some of the laterally extended traditional houses. Or, it may have a Georgian center hall with one or more rooms to either side. Unlike the full Georgian two room deep plan, the "I" House is one room deep. A center hall "I" House without architectural details of any particular style was a popular form in the Pinelands in the nineteenth century.

During the second half of the nineteenth century, new house types and styles were built in the Pinelands. They were inspired by houses popularized nationwide through architectural pattern books and periodicals which illustrated drawings, plans, and details of houses. These vernacular Victorian designs generally reflected a shift away from the symmetrical, classical Georgian, Federal, and Greek Revival styles toward the romantic or picturesque composition (Types 9, 10, 11).

In the Pinelands, the vernacular Victorians incorporated picturesque architectural details onto houses which generally retained earlier floor plans (Types 9, 10). By the mid nineteenth century, the central and side hall plans had become an established tradition.

Vernacular Gothic Revival, Italianate, and Second Empire style houses were built in the Pinelands. These houses had the old rectangular shapes with their one or two room deep, center hall or side hall plans. Porches became popular and roof shapes became more varied, although the gable roof still predominated. Windows became longer and more slender; two-over-two window sash replaced the earlier six-over-six sash. An L-shaped vernacular Victorian with a jig-sawed wood porch, vertical emphasis, and perhaps some Gothic or Queen Anne detailing was also popular (Type 11).

The traditional house without stylistic embellishments or separate circulation halls now turned its gable end to the street (Type 12), although the older traditional South Jersey houses with eaves elevation entrances were probably still being built.

In the early twentieth century, standard American popular house types were built in the Pinelands. Expanding upon the Victorian pattern book tradition and capitalizing on mail order merchandizing, companies provided house designs and plans through mail order catalogues. Sears Roebuck was one of the largest and most popular of these catalogues offering house plans. Local builders in the Pinelands, as elsewhere, built vernacular houses similar to those found in catalogues and periodicals.

Designs of this period include vernacular Colonial Revival houses. These were generally simple two or two and one-half story houses with a porch and a gable or hipped roof. The one story bungalow also appeared. A twentieth century log cabin was a more unusual type, built in some resorts and the new lake communities, such as Medford Lakes.

Traditional and Vernacular Houses of the Pinelands:

A Preliminary Typology

This typology is based on county, municipal, and regional watershed area historic architectural surveys of the Pinelands and a 1983 National Park Service study, Vernacular Residential Architecture in the Pinelands National Reserve. Typologies, especially of traditional buildings, should be based upon basic form, floor plan, and dimensions. Unfortunately, these surveys have not examined interiors or measured houses. Date attributions tend to be unreliable. Historical data on original or early owners is practically non-existent. Building types and styles have been variously labelled in New Jersey surveys (and in architectural and cultural geographical literature), which creates the problem of distinguishing different types from different terms. Consequently, accurate typologies and prototypical characteristics are difficult to establish.

The following twelve types are based on exterior form, with dimensions and door and window placement approximated. It is likely that other traditional types -- types more than one room deep and types more than one room long -- deserve separate classification. Here they are lumped together as Type 5. Their visual similarity on the exterior to other types is noted.

This typology covers houses from the late eighteenth through the late nineteenth century. As twentieth century houses in the Pinelands appear similar to standard houses of the period found elsewhere in the state, no special Pinelands types or styles have been noted for the twentieth century.

Traditional South Jersey House Types

Traditional South Jersey house types are one and one-half to two and one-half story wood houses with gable roof and entrance on the eaves elevation. They generally have one interior end chimney. The main floor frequently appear to be one room. Two and three room houses also exist. The entrance is directly into a room. These houses are of English origin. They were built from the mid eighteenth to the mid

nineteenth century. Some types were probably built as late as the end of the nineteenth century.

Windows may have multi-paned sash or the two-over-two sash that typified windows of the second half of the nineteenth century. Two-over-two windows are not necessarily indicative that the house is of a later date; they may be replacement windows on an earlier house.

Type 1. Early Cabin

The Early Cabin is a one and one-half story wood house, with a gable roof and entrance on the eaves elevation. It usually has three bays, a center door, and knee wall windows. One variation has a side door. Another variant has a two bay first floor and two knee wall windows above. Side and rear lean-to additions are common.

The floor plan may have one, two, or possibly three rooms. This type may include the British Cabin, which has a one or two room plan with a corner stairway. A more popular plan may have been the medieval Hall-and-Parlor plan, with the stairs in the medieval, or living hall, extending straight back from the entrance.

The Early Cabin is so named because of its early date and the lack of information on its floor plan(s) which precludes a more specific name. The cabins still extant are not necessarily older than other traditional house types; some may have been built as late as the early nineteenth century. Few freestanding examples exist today, probably due to their age and small scale. More examples exist today as part of nineteenth century houses and may be difficult to recognize because of alterations.

Type 2. South Jersey Center Door House

The South Jersey Center Door House appears to be the most popular traditional house type in the Pinelands and is found throughout the region, from farm areas to seaports to mill towns.

Type 3. Two x Two House

The Two x Two House is a two to two and one-half story, two bay, gable-roofed wood house, one room deep. It generally has two bays on both the first and second floors. A variation of this type has a second floor with only one window. The variation is generally found as part of an extended house.

The Two x Two House is a popular traditional house type in the Pinelands and is found throughout the region, from farm areas to coastal villages and mill towns.

Type 4. South Jersey Side Door House

The South Jersey Side Door House is a two to two and one-half story, three bay, wood house with side door entrance. The second floor has either two or three windows. The narrowness of the facade suggests the house has no side hall; entry and stairway are part of the main room.

A house with this facade configuration which is two rooms long or two rooms deep should be classified as a Multi-Room House -- Type 5. A house with a similar appearance which has a side hall should not be considered a traditional house. A sidehall plan house is a vernacular adaptation of the Georgian/Federal style and should be evaluated as Type 6.

This type appears to be relatively rare. The National Park Service's Vernacular Architecture Study suggested it is a subregional type, most often found along the fringe of the pine forest in the farm areas of Burlington County. Examples have also been identified in the Egg Harbor watershed. The visual similarity to multi-room and side hall plan houses currently limits the accuracy in identifying the Side Door House.

Type 5. Multi-Room House

The Multi-Room House is a two to two and one-half story, three bay house, with two or three rooms on the first floor. A central or side door leads directly into one room; there is another room to the side and/or rear of the house. This house type is generally built of wood; Burlington County probably has houses of this type in brick, especially the patterned brick houses. The facade configuration is similar to the South Jersey Center Door (Type 2), Side Door (Type 4), or three bay Center Hall House (Type 6). It should be classified separately because floor plan is a more important indicator of type than facade configuration.

The visual similarity of its exterior to these other houses limits the accuracy in identifying the Multi-Room House.

Vernacular Houses Influenced by Georgian Classicism

Vernacular houses influenced by Georgian classicism are characterized by a separate circulation hall and classical architectural details. They are two to two and one-half story houses with center or side hall plans. They generally have a gable roof and two or more interior end chimneys. The full Georgian plan is two rooms deep.

Because stylistic details are generally very simplified in the Pinelands, these Georgian-influenced vernacular houses are typed

according to floor plan rather than style. Houses with Georgian center or side hall plans but without any Georgian, Federal, or Greek Revival architectural details may be considered a hybrid of vernacular and traditional design.

A one room deep plan is generally called an I House. An I House may also be a hybrid of vernacular and traditional design. However, an I House does not necessarily have a separate circulation hall. A one room deep, extended house is also considered an I House and has no Georgian influence.

Vernacular Georgian, Federal, and Greek Revival houses were built in South Jersey and the Pinelands from the late eighteenth through the mid nineteenth century.

Type 6. Center Hall Plan House

The full center hall plan house is two to two and one-half stories high, five bays, two rooms deep, with a center hall, and two or four end chimneys. Houses generally have a gable roof with eaves entrance elevation. Houses are generally built of wood and sheathed in clapboard.

A one room deep variation of this type, called an I House, is common. The Pinelands I House often has four windows on the second story and few architectural details, giving it a traditional, rather than vernacular, character.

A second variation has a three bay facade with a center door and hall. The proportions, which allow for rooms to either side of a central hall, help distinguish this type from the traditional South Jersey Center Door House (Type 1), but this type can rarely be distinguished from the Center Door variety of the Multi-Room House (Type 5) without interior investigation. Brick houses were built in the farm areas of western Burlington County where Quaker and Delaware Valley influence was especially strong. The Burlington County examples generally have distinctive gable end window placement and bridged chimneys. Some of the early Burlington County houses also have patterned brick gable ends. Most of the South Jersey Patterned Brick Houses, however, are located south or west of the Pinelands.

Georgian architectural details found in the Pinelands include wooden door enframements, semi-circular lights and transoms above doors, and moulded window trim. Federal architectural details include delicately proportioned wooded door enframements, leaded fanlights, transoms and sidelights, and quarter windows on the gable end. Greek Revival architectural details include pilastered door enframements, broad transoms and sidelights, and Greek columns. Original windows had multi-paned sash.

Full Center Hall Houses are found in coastal villages and ports and the farming areas of Burlington, Camden, and Ocean Counties. The full Georgian House is less prevalent in the forest areas, where the I House is more common.

Type 7. Side Hall Plan House

The Side Hall Plan House is a two to two and one-half story, three bay house with side hall plan, two rooms deep. It has a gable roof with eaves entrance elevation and generally has one or two interior end chimneys.

Sometimes this side hall plan house is called vernacular Federal, since most examples were built during the Federal period -- the first quarter of the nineteenth century. Occasionally these houses have dormers, a transom and sidelights, fanlights, attenuated classical door enframements, quarter windows, delicate classical cornices, or other vernacular Federal architectural details. Greek Revival details such as pilasters and broader-than-Federal-style proportions can also be seen, but, as in most areas of New Jersey, Federal forms and detailing survived quite late and houses of the third quarter of the nineteenth century were more likely to have a combination of the Federal and Greek Revival than full-blown Greek Revival styling.

Brick side hall plan houses are found in Burlington County and, like the center hall plan houses there, may have bridged chimneys.

The side hall plan house was quite popular, especially in the farm areas and villages of western Burlington County and in coastal areas.

Extended Houses

Traditional and vernacular house types were often combined into extended houses in the Pinelands. The houses were usually extended laterally to create flush facades, but could vary in height and width. Traditional one room deep houses extended laterally to create flush facades and have the same height and width are a form of an I House.

Type 8. Extended House

A variety of extended houses can be found in the Pinelands. There are mirror image traditionals (such as a Double South Jersey Center Door House, or a Double Two x Two House); mixed traditionals (such as a South Jersey Center Door House with a Two x Two House or British Cabin); or vernacular/traditional combinations (such as a Side Hall Plan House with a South Jersey Center Door House).

The extended houses may be one family houses with two front doors or may be two family houses. Some may have been built in sections; others were probably built at one time. Not all have two front

entrances; in some, the second entrance has been eliminated. Rear ells probably exist in smaller numbers.

The South Jersey Center Door House with a Two x Two House appears to be the most prevalent extended house form. It is found throughout the Pinelands.

Vernacular Victorians

The vernacular Victorian houses which became popular in the Pinelands in the second half of the nineteenth century are classified according to either style or form. Most retain rectangular forms and are related to earlier nineteenth century vernacular center or side hall plan houses. It is interesting that the Gothic is a particularly popular vernacular Victorian style and may relate to the preference for verticality in traditional Pinelands house types.

Type 9. Vernacular Gothic Revival House

The vernacular Gothic Revival House is generally a two and one-half story, five bay wood house, one room deep with a center hall plan and cross gabled roof featuring a mitre-arched window. Bold wooden bargeboards sometimes decorate the roofline. Vernacular Victorian porches with turned posts, brackets, and jig-sawed decoration are common.

A three bay, one and one-half story cottage form of this type can also be found.

This is a very common house type, found throughout the Pinelands. Some were undoubtedly Downingesque alterations of older houses in which a cross gable was added to create a picturesque effect and improve attic space.

Type 10. Italianate and Second Empire House

The Italianate and Second Empire House is a one and one-half to two and one half story, wood house with a five bay center hall plan or three bay side hall plan, one or two rooms deep.

The Italianate House usually has a traditional gable roof, but a bracketted, shallow pitched roof can also be found. Larger and more slender windows with two over two sash, bracketted roof cornices, and jig-sawed porches are typical features.

The Second Empire House is similar in form and detailing to the Italianate and is characterized by a mansard roof with or without dormers.

These are fairly popular styles, found in coastal villages, farm areas, and railroad settlements.

Type 11. L-Shaped House

The L-Shaped House is a two and one-half story wood house with a porch and entrance on an eaves elevation connected to a slightly projecting gable front section, creating a house in a reverse L shape. The sections appear tall and narrow and the gable roof is generally rather steeply pitched. The vertical emphasis, decorative bargeboards, and occasional pointed arched window often give this house type a Victorian Gothic flavor. Varied textures and architectural details such as turrets also can be found, giving some of these houses a Queen Anne character.

The L-Shaped House is a common house type found in the pine forests, coastal area and railroad settlements.

Type 12. Gable Front House

The Gable Front House is a two or two and one-half story wood house, one or two rooms deep with its entrance on the gable end. One variant has a two bay arrangement on the first and second stories. Other variants have three bays, with either a center or side door. Jig-sawed wooden porches are typical. Mitre-arched gothic windows are common.

Gable front houses were a popular house type for worker housing and they are common in railroad settlements.

Research Priorities

The research topics identified below are derived from a review of the historic architectural inventories commissioned by Burlington and Ocean Counties and the Office of New Jersey Heritage and from a wind-shield survey of Pinelands residential architecture undertaken for the zPinelands Commission and the National Park Service. The primary effort of all research into the indigenous architecture of the Pines should be directed toward development of a reliable typology. The preliminary typology presented in this plan is a tentative one and its chronological sequence is based on other areas of the state.

1. What is the building type represented and what is the relationship of the type to social factors, function and other architectural styles? To address these questions, information on the following topics must be collected:
 - a. Typing factors
 - 1) frequency
 - 2) location/range
 - 3) sources/origins of motives and features

- b. Relationship of original plan type to ethnicity
 - 1) reflections in layout, functional features and decorative elements
 - 2) changes to plan relating to ethnicity of occupants
 - 3) local adaptation of ethnic types; modifications caused by:
 - a) environmental conditions
 - b) materials availability
 - c. Relationship of building type to function
 - 1) location of type: rural vs. settlement
 - 2) agricultural residential types vs. industry workers' housing vs. undifferentiated settlement types
 - d. Occurrence of different types in association with each other
 - e. Local adaptations of types
2. What is the construction history of the structure and why did alterations occur? To address these questions, information on the following topics must be collected:
- a. Construction history relating to:
 - 1) techniques
 - 2) materials
 - 3) design
 - b. Alterations relating to:
 - 1) technological advances
 - 2) modernization of design
 - 3) changes in function
3. How does the systems arrangement relate to changing use patterns and social conditions? To address this question, information on the following topics must be collected:
- a. Domestic functions: how they occurred
 - 1) methods of heating and lighting
 - 2) food preparation
 - 3) sanitary arrangements
 - 4) sleeping accommodations
 - 5) social interaction
 - 6) storage
 - b. Reflections in systems and their arrangement to:
 - 1) ethnicity
 - 2) socio-economic class

- 3) employment
 - 4) natural environment
- c. Relationship of functional outbuildings
- 1) use of space among them
 - 2) adaptation to natural environment
4. Do the decorative elements employed reflect use, regional styles, ethnic origin, socio-economic status, etc.? To address these questions, information on the following topics must be collected:
- a. Origin
 - b. Required skills
 - 1) tools
 - 2) where skills were acquired

The best sources of data regarding the vernacular residential architecture of the Pinelands are the county cultural and heritage commissions and local historical societies. Local societies possess specific information regarding historic houses within their jurisdiction while the county commissions possess more broad ranging inventories. The Burlington and Ocean County Commissions have each published extensive historic sites inventories. The only other regional survey of architecture in the Pine Barrens is one undertaken of the Great Egg Harbor and Tuckahoe Rivers watersheds at the behest of Preservation New Jersey.

Additional information relating to ethnicity can be gleaned from genealogical societies, municipal directories, social organizations, tax records and the federal and state censuses. Nineteenth century pattern books will of course be useful in establishing a typology and assessing modifications. More general sources of data include:

- Hexamer surveys
- Deeds, wills and inventories
- Road returns (occasionally)
- Historic photographs
- Oral history
- Title abstract companies and insurance companies
- Historic Sites Inventory (Office of New Jersey Heritage)

The minimum integrity that a site must possess to have research potential would include demonstrable evidence of original features or historic alterations to the fabric indicative of a change of use or occupancy. An assessment of a site's integrity should focus on survival

of early floor plans or other indications of how domestic functions occurred. Intact remnants of related outbuildings should not be overlooked in the evaluation.

Sufficient data will have been obtained at a residential site to meet most of the recognized research questions when the site has been fully recorded archaeologically and architecturally according to the Secretary of the Interior's Standards for Archaeology and Historic Preservation. Research objectives related to ethnicity, socio-economics and employment will require compilation of additional historical documentation - census data, local directories, church and social organization records, company logs, etc. - in order to be considered adequately addressed.

Following is a list of sites significant in the broad patterns of regional, state or national history that have been associated with Pinelands vernacular architecture. This list may be used to assess the importance of individual resources whose value might not otherwise be recognized.

SIGNIFICANT SITES ASSOCIATED WITH
PINELANDS RESIDENTIAL ARCHITECTURE*

<u>Location</u>	<u>Significance</u>
Whitesbog	Good examples of agricultural workers' housing and the largest cranberry packing house extant in N.J.
Batsto	Iron workers' housing and iron-master's mansion
Mays Landing	"Captain's" houses, rural architecture and industrial workers' housing
Dennisville	State Register historic district; vernacular adaptations of recognizable 19th century styles
Corbin City/ Tuckahoe	Good examples of 18th and 19th century regional house types
Port Elizabeth/ Dorchester/ Leesburg	Scattered throughout this area are good examples of the South Jersey house type
Medford Lakes	Development of 20th century log cabin style

*This is a list of places where some significant and representative residential architecture types may be found.

SPECIAL EVALUATION AND RECORDING
REQUIREMENTS

I. Evaluation

The following sections set forth the methods to evaluate the qualities and the integrity of individual residential sites in accordance with the criteria for Pinelands Designation (pp. 19-20) and the four resulting categories of physical remnants (p. 34).

A. Definition of a Vernacular Residential Site

Vernacular residential architecture - A dwelling designed to reflect local tradition, taste, and environment, and constructed by community craftsmen with local materials. Often vernacular architecture includes popular forms which have been modeled to conform to a community's traditions. For example, a structure whose design is based on a style not native to the area would still be classified vernacular if it is built with local materials and incorporates a floor plan, building techniques, proportions, massing, or other elements that are indigenous to the area.

B. Evaluation Methods

1. Pinelands Designated Sites

Pinelands Designated sites are those which have been determined to be significant to the region and acknowledged as such pursuant to N.J.A.C. 7:50-6.154. In such instances, the evaluation process is already complete and the treatment provisions set forth on pp. 34-46 and in Section II below apply.

2. Unevaluated Residential Sites

If a cultural resource survey uncovers a residential structure, it must be evaluated both for its significance and for the integrity of its physical remnant. If significant and reasonably intact, it is a significant resource. If lacking in significance or in integrity, it may be classified either as sufficient remains or insufficient remains.

a) Significant Resources:

The following guidelines should be used to evaluate significance:

(1) Research potential:

Resources eligible under this criterion include any vernacular residential site whose physical remnants are capable of addressing one or more of the research questions identified in the "Research Priorities" section (p. 219ff.) of this chapter or

any other research questions which a qualified professional can specifically justify. The resource must also be determined to possess the requisite historical integrity, i.e., the structural features and/or artifactual strata capable of addressing the question(s) must be clearly identified and found to be sufficiently undisturbed or unaltered from the period of significance to be able to yield research information.

- (2) Association with significant persons in local, regional, state or national history:

Resources eligible under this criterion include those which retain their historic integrity (i.e., a large proportion of their historic fabric is intact and retrievable) from a period of direct association with an individual responsible for notable achievements in:

- developing the economic base for a community, the Pinelands, the state, or the nation; or
- the social or political history of the Pinelands.

- (3) Significant architectural or engineering components:

Resources eligible under this criterion include vernacular residential structures that:

- illustrate a nationally recognized architectural style as expressed in the building traditions of the Pinelands, the state, or the nation;
- illustrate a distinctive local variation of a nationally recognized architectural style;
- illustrate the vernacular building traditions of the Pinelands;
- illustrate how a residential architectural style was adapted to local conditions or a Pinelands specific function;
- reflect the particular building traditions or engineering technology practiced by a craftsman who can be distinguished from others by the style, approach or quality of his work; or
- represent an adaptation to a Pinelands specific activity.

The resource must also retain its historical integrity in order to be considered significant, i.e., a large proportion of the fabric from its period of significance must survive in an intact, retrievable condition. Specifically, the physical remnants which reflect the appropriate qualities listed above must be present and largely unaltered.

If any of the above criteria applies, the resource is considered to be significant and the treatment recommendations set forth on pp. 34-46 and in Section II must be consulted. If none applies, a determination must be made as to whether the site possesses sufficient or insufficient remains, as described below.

b) Sufficient Remains:

It is possible that residential sites which are not eligible for Pinelands designation may yet have value as indicators of cultural evolution. If there is evidence of a cultural activity on the project site which demonstrates human alteration of the natural landscape for purposes of occupation or extended use, the resource is considered to possess sufficient remains and the treatment recommendations on pp. 46-47 apply.

c) Insufficient Remains:

If a residential site is determined to contain insufficient remains because its physical remnant has not survived or only minimally survived, no treatment measures are required.

II. SPECIAL RECORDING REQUIREMENTS

In addition to the general standards for the treatment of historic resources (see Chapter IV), there are special recordation requirements that apply only to Pinelands Designated and significant residential sites. These special requirements pertain only to sites that have research potential or architectural or engineering significance and must be carried out in accordance with the Secretary of the Interior's Standards for Archaeology and Historic Preservation.

These specialized requirements are as follows:

(1) Resources with research potential

- Historical research, including oral historical when appropriate, sufficient to address the research topics to which the residential site can contribute information. If this includes any of the "Research Priorities" identified on p. 219ff., the necessary documentation may require research into such aspects as the ethnic origin, socio-economic class and occupation of the residents, if

possible. The purpose of the research will be to define those factors important to an understanding of the evolution of the physical remnant of the resource.

- Appropriate drawings and/or photographs and written descriptions that document all aspects of the residential site must be prepared. A site plan that clearly defines the relationship of the main structure and any other outbuildings or features in the complex must be prepared.

(2) Recording requirements for significant architectural or engineering resources

- An outline written description and history of the building, photographic documentation and minimal graphic documentation will be required if the resource is an unusually complete example of a typical design in the Pinelands with its important physical features well preserved.

CHAPTER V

CULTURAL RESOURCES MANAGEMENT AND INTERPRETATION

Introduction

The approximately one million acres of southern New Jersey which constitute the Pinelands National Reserve have supported a variety of uses in the past--such as forestry, iron-making, agriculture, residences and recreation--and under the Pinelands Comprehensive Management Plan of 1980 will continue to do so in the future. Cultural resources management and interpretation insures that evidence of these past occupations--structures, artifacts, and traditions--are recorded, protected and made intelligible to the public. It encompasses archaeological, historical and folklife research; structural, artifactual and documentary preservation; and ultimately public programming.

Thus far the Pinelands Commission has embarked on the first of these three tasks by attempting to locate and document remnants of past human occupation. Although research is far from complete, the Comprehensive Management Plan includes a preliminary inventory of historical and cultural resources, and strategies are under consideration for locating and documenting the area's prehistoric sites. Based on research to date, the Pinelands Commission has also undertaken the second cultural resource management task, preservation, by preparing this cultural resources management plan for local communities to insure the protection of Pinelands historic sites. The Commission looks forward to beginning the third task, interpretation, and along with other Pinelands groups is presently considering what types of interpretive programs could best increase public appreciation of the area's historic and prehistoric resources in the future.

Interpretation as a Tool in Pinelands Cultural Resources Management

"Interpretation" involves ways to foster greater public awareness, understanding and appreciation of the nature, history and culture of an area. An interpretation program can include directed and non-directed recreational opportunities, informative brochures, roadside signs, maps, museums, exhibits, tours, demonstrations, mass media and teacher workshops. Interpretation serves to enrich visitor experiences in an area as well as to provide local residents with perhaps a new perspective on their familiar surroundings. Interpretive programs also offer vehicles for local groups to publicize their activities and communicate their perspective on issues of contemporary concern.

Interpretation promotes cultural resource management goals by locating historic structures in their natural and social contexts, making the reasons for protecting them more intelligible to the public.

Communicating the significance of endangered resources can encourage increased public support for protection and maintenance. In addition, interpretive programs offer excellent opportunities to explain the variety of appropriate uses for historic structures, as well as to demonstrate the direct, tangible benefits of cultural resource protection and preservation efforts.

In the Pinelands, cultural resource protection and interpretation strategies must extend over a multiplicity of diverse landscapes, histories and cultures. The Preservation Area in the "heart" of the Pinelands is mostly pine and oak forest, sparsely settled by residents with long-held ties to forest industries. To the south and west is prime agricultural land, with residents growing berries or vegetables or operating dairy farms. Newly developed, densely settled suburbs of Philadelphia and Atlantic City lie on the western and eastern fringes of this area. The many residents of Pinelands coastal areas which stretch from Ocean County across to the Delaware Bay, make their living primarily from fishing and tourism. Retirement, military and diverse ethnic communities also dot the entire Reserve.

While recognizing the extraordinary diversity of landscapes and traditions in the Pinelands, there is also advantage in considering the interpretation of the region's cultural resources as a whole. The significance of many Pinelands activities and areas, past and present, whether iron-making, cedar mining or the enactment of a Comprehensive Management Plan, is best understood in relation to larger themes encompassing region, state and nation. Communicating the relation of local historic sites and traditions to regional themes also helps to build Pinelands-wide preservation consciousness among local residents and visitors. Moreover, a regional approach to Pinelands interpretation can help visitors to one Pinelands area learn what other parts of the vast Pinelands National Reserve have to offer, directing tourism systematically to areas best prepared to handle it and away from fragile or endangered sites. An integrated regional approach to interpretation also offers the opportunity for local historical and cultural societies in different areas of the Pinelands to share and exchange interpretive materials and expertise, as well as information about outside sources of assistance.

Current Cultural Resources Interpretation Programs in the Pinelands

Although the Pinelands is best known for its unique flora and fauna, and for the enormous Cohansey Aquifer below, the region's historical and cultural resources also possess great public educational value. The area was home to successive occupations of Amerindian groups and European immigrants. In the 18th and early 19th centuries, the Pinelands produced forest products, ships, iron and glass for Philadelphia and the surrounding region. Agriculture, especially berrying, grew in importance from the late 19th century to the present, as did the tourism and recreation industries along the coast. Each occupation left behind evidence of particular ways of manipulating the landscape--from water powered mills to systems to flood cranberry bogs. Each occupation also brought unique patterns of social relations and cultural values. Among the sites reflective of these patterns are the standing remains of past

agricultural enterprises at Whitesbog and Double-Trouble; of rural iron, glass and milling industries at Weymouth, Harrisville, Atsion, Batsto, Pleasant Mills and Estell Manor; of numerous past maritime enterprises and lighthouses along Barnegat and Delaware Bays and Pinelands rivers; as well as publicly owned historic mansions.

Many government buildings, private residences and commercial establishments also possess great significance for Pinelands history and culture. More than 1000 archaeological sites from before European settlement are known to exist in the region, including nationally significant findings at Savich Farm, Evesham Township. Contemporary cultures--the lifestyles of living Pinelands residents--also constitute an important Pinelands educational resource which the public can experience in tangible form through reading or hearing stories, seeing artworks and handicrafts and attending concerts, dances and crafts demonstrations.

Pinelands history and culture are currently interpreted primarily through museum exhibits, tours and speakers at local historical society meetings. One major exception to the pattern is Batsto Village. Wharton State Forest has a full-time public interpretation program tracing the site's evolution from iron-making in the 18th century through Joseph Wharton's empire in the late 19th century. Batsto also sponsors craft and sawmill demonstrations in some of the three dozen historic structures on its grounds. The Batsto Citizens Committee and Indian Mills Historical Society have published interpretive brochures and articles on Batsto as well as other sites within the Wharton Tract such as Atsion. Among the other places where Pinelands history is interpreted to the public are Wheaton Village, which has a museum of glass-making and is developing exhibits on other South Jersey crafts; the Renault and Tomasello wineries; the Ocean County Historical Society Museum in Toms River; the Smithville (Burlington County) manufacturing complex; and the Medford Historical Society Museum at Kirby's Mill. Ruins of a historic glassworks, a World War I ammunition plant and the Steelman family plantation at Atlantic County's Estell Manor Park are interpreted on a guided basis by request. Medford and Mays Landing have prepared "walking tour" brochures of their downtowns for visitors and residents. The Burlington County Historical Society joined with the County Cultural and Heritage Commission in 1976 to prepare two self-guided automobile loop tours of the county, as well as Structure and Ornament, a guide to the county's historical architecture and sites open to the public.

There have been a few attempts to interpret Pinelands history and culture through television, film, music, and mass-circulation magazines. The Ocean County Cultural and Heritage Commission produced a 30-minute video cassette/slide program on the history of Ocean County through its architecture, which will be available to local groups and broadcast over the local cable television network in the Fall of 1983. "Mass media" was also used recently to interpret the area's folklife when New Jersey Public Television, in cooperation with the New Jersey Historical Commission, produced a film on the traditional culture and activities of Barnegat Bay residents. Weekly concerts sponsored by the Pinelands Cultural Society at Waretown offer the public additional opportunities to learn about the folklore of the Pines. Probably the most widespread

dissemination of information about Pinelands history and culture occurred not as the result of a comprehensive public interpretation program, but rather through John McPhee's impressionistic series of articles in the New Yorker in 1967, reprinted in his best-selling book, The Pine Barrens. Subsequent articles on the Pinelands have appeared in National Geographic, Smithsonian, and Audubon magazines. In a category all its own was the \$1.2 million multi-media New Jersey exhibit at the Smithsonian Institution's 1983 Festival of American Folklife in Washington, D.C., where Pinelands lore was represented along with that of the rest of the state.

Along with interpretation programs for the general public, curriculum units on Pinelands history and folklife have been developed for elementary and secondary schools. The Conservation and Environmental Studies Center, Inc., at Whitesbog, created and marketed complete curriculum packets and activities for all grade levels on Pinelands topics such as "exploring a forgotten site" and "life in a company town." The Pinelands Commission has assembled and distributed information packets on its activities, and on the Pinelands in general, to more than 500 school teachers throughout New Jersey. More recently, the Commission established a staff position for an education specialist to expand its existing programs. In addition, the Archaeological Society of New Jersey, Pinelands Cultural Society and several county and local historical societies present regular assembly programs in area schools. Like cultural resources interpretation programs for the general public, developing and incorporating Pinelands history and folklife curriculum has been up to the individual locale, with little central direction or commitment for regional coordination. This has occurred even though the school districts with Pinelands programs, such as Haddonfield, Cherry Hill, Maple Shade and Medford, have expressed a willingness to share their materials with interested groups, and the Pinelands Commission has been pursuing funds that would enable it to play a more active role in coordinating and enriching Pinelands educational programs in the future.

Along with programs that inform the public about the historical significance of particular Pinelands cultural resources are educational materials and workshops on historic preservation in general. The Office of New Jersey Heritage in conjunction with Preservation New Jersey, Inc., publishes 4-6 issues of Preservation Perspectives annually, with a statewide circulation of 2000-3000 copies. New Jersey Heritage has also participated in historic preservation workshops hosted by the Ocean County Cultural and Heritage Commission and by the Burlington County Cultural and Heritage Commission. Although few preservation education programs have been aimed at persuading land use attorneys and accountants to advise their developer clients that preservation makes good economic sense, it is anticipated that such programs could be held in the future. These could be held in conjunction with workshops on ways to use the material contained in this Cultural Resource Management Plan.

Summary of Current Pinelands Cultural Resources Interpretation Programs

Current programs that interpret the history and culture of the Pinelands to the public tend to fall into one of two extreme categories. At the one extreme are well organized groups, such as schools or

historical societies, that provide their students and members with highly directed activities such as guided tours, hikes, lectures, and workshops. At the other extreme, interpretive programs offered to the casual visitor to the Pinelands are overwhelmingly non-directed. Unless Pinelands visitors already know what to look for and where to find it, they rarely discover information about the location and significance of the area's historical and cultural features. Pinelands historical interpretation for special populations--persons elderly, non-English-speaking, or with physical or mental handicaps--is also virtually non-existent.

New Directions in Pinelands Interpretation: The Preliminary Findings And Recommendations of the Pinelands Interpretation Committee

From the above overview of current programs that interpret Pinelands cultural resources to the public, gaps can be identified in visitor orientation, in regional coordination of existing programs, and in developing new interpretive materials and programs for topics and audiences currently overlooked. No regional system of signage, brochures or visitor centers exists to direct tourists to sites of cultural interest able to handle visitation or to inform them of special programs and hours of operation. Local historical groups rarely pool their limited resources across county lines to undertake cooperative regional interpretive programs or even to publicize one another's individual programs among their members. Readily accessible historical interpretive programs or materials don't even exist for some of the most heavily used Pinelands areas--the Batona Trail, popular canoe streams--or for sites associated with the history of important Pinelands topics such as agriculture (no interpretive programs for the casual visitor to Whitesbog or Double-Trouble) or American Indian life (no interpretation programs for the casual visitor to the Savich Farm or Brotherton Reservation sites).

It was to remedy these gaps that the New Jersey Department of Environmental Protection asked the National Park Service to assemble a "Pinelands Interpretation Committee" to develop a list of interpretive program recommendations for Pinelands groups. Invitations were sent to a number of state agencies, non-profit organizations, businesses, and individuals with an interest in Pinelands affairs, soliciting their participation in setting the Pinelands regional interpretation agenda. Over two dozen representatives of these organizations gathered for five working meetings in the summer of 1983 to discuss common problems, propose solutions and initiate action.

At its second meeting, the Pinelands Interpretation Committee identified the following five goals and objectives of Pinelands interpretation:

1. Increase public awareness of the need to protect and manage Pinelands natural, historical and cultural resources.
2. Attract and direct visitors to Pinelands areas able to handle visitation and away from areas unsuitable for increased public use.

3. Coordinate and disseminate existing information about Pinelands resources and resource experts among state and local public and private agencies and organizations.
4. Encourage the development of new interpretive materials on a wide range of Pinelands topics, designed for a wide range of abilities and audiences, including school curricula from kindergarten through college.
5. Relate the interpretation of Pinelands nature, history and culture to contemporary issues that affect the Pinelands, New Jersey, the nation and the world; remind the public that the Pinelands National Reserve is a "living landscape" that is still evolving and not frozen in time.

The Committee noted that one obstacle to the realization of these goals is overlapping jurisdictions. With no single agency possessing the financial resources or authority to implement the entire interpretation agenda, partnerships must develop among federal, state and local government agencies as well as private organizations to share resources and responsibility. The Pinelands Interpretation Committee members proposed remaining together to maintain communication among the various Pinelands interpretation groups and to provide a framework through which new cooperative public programming could be developed. The Committee pointed to the existence of similar organizations in other parts of the U.S., such as New York's Regional Conference of Historical Agencies, as evidence that such an umbrella organization could succeed. The Pinelands Interpretation Committee also recommended that the Pinelands Commission take the lead in working with limited resources as well as to channel any assistance that could be provided by the Department of Environmental Protection or the National Park Service in regional facility planning, insuring that Pinelands visitors are directed only to areas suitable for increased public use. Although the Pinelands Interpretation Committee report invited all Pinelands agencies and organizations to participate in all aspects of a regional Pinelands interpretation program, it was felt that jurisdictional uncertainties could best be overcome by the designation of the Pinelands Commission as the lead agency in dealing with interpretation issues.

A second obstacle to the realization of the Committee's goals and objectives for Pinelands interpretation is the fragile condition of many Pinelands cultural resources and their extremely limited capacity for public visitation. Many historic structures are in a state of deterioration, with development pressure (especially in areas targeted by the Pinelands Comprehensive Management Plan for "regional growth") and lack of regular maintenance contributing to the decline. Moreover, two-thirds of the Pinelands National Reserve is privately owned, much of it agricultural land especially susceptible to damage from trespassing and vandalism. The Pinelands Interpretation Committee proposed addressing the problem of balancing resource protection versus public use by having the New Jersey Department of Environmental Protection and the National Park Service create a comprehensive interpretive plan for the Pinelands. The plan would carefully examine the relative ability of local areas to handle visitation with the least adverse impact and

recommend new or restored interpretive facilities and programs appropriate to each area. The New Jersey Department of Environmental Protection has already commissioned a State Historic Villages Master Plan to consider some of these issues.

A third obstacle to the realization of the Committee's interpretation goals is the relatively poor knowledge about many Pinelands cultural resources. Inventories of Pinelands folklife and cultural resources lag behind those of some of the region's natural features. Rutgers University's Compendium of Archaeological, Cultural and Historical Literature of the New Jersey Pine Barrens (1983) will help facilitate research in cultural resource fields, as will the study of Pinelands folklife undertaken in the Fall of 1983 by the American Folklife Center of the Library of Congress. The Pinelands Interpretation Committee report recommended that the Pinelands Commission continue to make the results of historical, archaeological, and folklife research readily available to local historical organizations in the future, and, as managers of the "Man and the Biosphere" program, encourage research into patterns of past and present human occupation of the Pinelands as well as that of flora and fauna.

Funding presents a final obstacle to the realization of the Pinelands Interpretation Committee goals. Although the Committee report did not identify definite sources of funding for the proposed new regional Pinelands interpretation programs, it noted that several major public and private sources of assistance--the New Jersey Historical Commission, Office of New Jersey Heritage, Private Industries Council, and Department of Corrections--have supported similar Pinelands cultural resource protection and interpretation projects in the past. Along with the State Committee for the Humanities and Council on the Arts, these organizations have tentatively expressed interest in supporting more such projects in the future. In addition, National Park Service Land and Water Conservation Fund money is available to the N.J. Department of Environmental Protection on a matching basis to undertake interpretive facility planning in the Pinelands. The Interpretation Committee report also noted that very successful interpretation programs have been presented by local historical societies using largely volunteer labor and funded by fairs, flea markets, membership dues, the sale of souvenirs and publications and small subventions from local governments. Moreover, state government and local historical societies can share the cost of administering Pinelands historic sites, as they have done elsewhere in N.J. (and currently do to some degree at Whitesbog and Double-Trouble), and as Pinelands nature clubs have done with county nature centers. The Pinelands Interpretation Committee recommended that a regional subcommittee form to explore these outside funding opportunities and innovative cooperation strategies for interpretation projects.

The Pinelands Interpretation Committee draft report proposed that additional regional volunteer subcommittees be formed to work with appropriate agencies on a number of specific interpretation projects, such as a regional visitor orientation folder, public lectures and

workshops, travelling exhibits, signage, auto/bicycle/hiking tour routes, mass media, school curricula, special audiences and the involvement of local businesses. The proposed subcommittees would be designed to encourage in their respective project areas both individual and regional collaborative interpretive efforts among local historical societies.

Cultural Resource Interpretation for the Public: Some Ideas For Local Officials

Whether or not the Pinelands Interpretation Committee's draft proposal for a comprehensive, integrated, regional program interpreting Pinelands nature, history, and culture to the public ever materializes, local historical societies and municipal officials can develop interpretive brochures, signs, and tours within their towns, based in part on the Committee's findings and suggestions. Local interpretive programs remain at the core of Pinelands interpretation. They can and should reflect not only the local importance of the sites they interpret, but also some of the larger regional themes mentioned in the previous chapters of this Cultural Resources Management Plan.

The most important aspect of any interpretation program is communicating to the public why the resource is important. A site's significance is neither inherent nor obvious; rather, it derives from the chronological, regional, natural, and social contexts in which it is explained. Effective interpretation evokes the surrounding structures, society and traditions not immediately visible and enables the public to understand the place of the resource in the whole of Pinelands history and culture.

Interpreting a site in terms of its chronological context involves explaining its importance not only in a single period, but also over its entire history. Since the human occupation of land or structures is rarely frozen in time, Pinelands interpreters could communicate all the various uses the site has undergone and not merely try to recreate one period of its existence. Even the careful restoration of a historic structure to a particular date in the past does not preclude interpretive materials explaining its uses before or after that date. Multi-period interpretation enables the public to more readily experience the reality of evolving historical processes and to recognize that the fabric of their own contemporary environment is itself the product of old and new.

Cultural resources are more fully understood in terms of their regional and national, as well as local, context. Structures such as taverns, courthouses, railroad depots, and boat landings were often places where the outside world came in contact with local residents. Local agriculture and industries flourished or declined based on external market conditions; local religious and political movements, as well as participation in wars, was often linked to those in other parts of the country. Each Pinelands resource can be interpreted in terms of both its uniquely local aspects and its aspects that reflect larger regional and national patterns of commerce, thought, and behavior.

Pinelands cultural resources also gain intelligibility through interpreting their relationship with nature. Pinelands residents both shaped and were shaped by the natural landscape in ways that left behind artifactual evidence offering superb interpretive opportunities. Human relationships with water range from the elaborate hydrosystems erected to power mills and flood cranberry bogs to the subtle adaptations reflected in the design of a sneakbox. The relation between humans and wood--cedar, oak and pine forests--runs through every industry and stage of Pinelands development. The history of human manipulation of and adaptation to the Pinelands natural landscape also offers interpreters excellent opportunities to discuss present resource protection efforts, such as the creation of the Pinelands National Reserve.

Just as every Pinelands cultural resource has a relation to time, place and nature, so it also has a relation to society. A site's social context--how human society has organized around it--can be interpreted to the public by tracing the local patterns of commerce, customs, traditions and institutions (such as churches, fraternal organizations and government) that have held Pinelands maritime, agricultural, manufacturing and forest communities together over time.

Besides these four general contexts, which are worth considering in interpreting any cultural resource in the Pinelands, the preceding chapters of this Cultural Resource Management Plan also contain more specific interpretive themes and suggestions for each resource unit. Not coincidentally, the questions for future research identified at the end of each chapter of the Plan also make for excellent interpretive themes: explaining what still needs to be known about a resource helps the public to better understand why the resource must be protected.

Among the themes groups wishing to interpret the history of Pinelands agriculture could consider are 1) how farmers used and affected the natural landscape, and 2) what kinds of market and soil conditions let Pinelands farmers grow what they grew. The initial question discusses agriculture as a comprehensive system of not only farmhouses and fields, but also outbuildings and systems for irrigation and fertilization. Among the themes the second question examines is how berrying and truck farming emerged in the mid-19th century as a response to acidic soil conditions and the inability of Pinelands farmers to compete with large-scale cereal and livestock farmers further west. Berrying is an especially important topic for Pinelands interpretation, offering an opportunity to discuss the White family, the many cranberry/blueberry artifacts in local collections and the past and present methods of cultivation in an industry that is still important to the region.

The large-scale rural industries that dominated the Pinelands in the early 19th century, glass and iron manufacturing, offer opportunities to interpret not only the relation of old and new technologies and use of natural resources, but also changes in the social organization of manufacturing from artisan to the factory system. Iron in particular virtually reorganized the entire Pinelands economy, creating concentrated settlements near furnaces and providing new markets for farmers, sawyers, colliers, teamsters and boatmen, as well as local laborers. The web of social life in a company town can be evoked

through the interpretation of an entire village (such as Batsto), the ruins of a furnace stack (such as Weymouth), or even, with imagination, a single iron pig in a museum collection.

The smaller scale industries which proved longest lived in the Pinelands--sawmills and grist mills, maritime activities and the so-called "minor" industries--offer additional opportunities to discuss the close relation of man and nature in the Pinelands, especially the interdependence of Pinelands coastal, agricultural and forest areas. Maritime, forest and grist mills used water as a source of power and an avenue for transportation; wood provided not only a livelihood for the sawyer, but also a source of raw materials for the miller and shipbuilder. Another possible interpretive theme in these industries is the social role played by the miller, sawyer and boatman in their respective scattered, rural communities. How Pinelands residents adapted technological innovations to local conditions is yet a third interpretive theme, offering the opportunity to discuss the extreme diversity of activities that has characterized the Pinelands virtually from its earliest human occupation.

Interpreting the history of Pinelands transportation networks--rivers, railroads and highways--presents a challenge slightly different from interpreting a manufacturing site or farm. Here the role played by technological innovation is crucial, as is the impact of successive forms of transportation and particular transportation routes upon patterns of settlement, commerce and ideas in the Pinelands. Signs along historic routes, as well as on taverns, rail depots and support facilities, can enhance public awareness and appreciation of this sometimes underestimated category of resources. The many abandoned but still standing railroad stations in Pinelands towns offer excellent sites to interpret this facet of the region's history in more detail.

Local historical societies can attempt to integrate the material contained in the preceding chapters of this plan to present a comprehensive history of their community to the public. The chapter on Pinelands settlements suggests that interpreters consider changes over time in their town's size, ethnic and class composition, its reason for existence and its relations with the surrounding countryside, as well as address issues of its planned versus unplanned growth. The vernacular architecture study outlines ways to classify the typical building forms in a town and to relate those forms to those in other areas of the Pinelands and the United States. Both topics provide excellent points of departure for local interpretive programs and brochures.

In Conclusion: Planning A Local Pinelands Cultural Resources Interpretation Program

Despite the previous section's identification of various "contexts" and specific interpretive themes for resource groups, it is important to remember that more than one context and theme can and should be employed to interpret Pinelands cultural resources locally. A wide range of past and present local activities can be discussed at the one or two places suitable for public visitation in most towns. Interpretation programs also need not be limited only to the "type" of site present. It is not

necessary to have an iron furnace in a town to discuss the impact of the iron industry in the Pinelands. Since effective cultural resource interpretation informs the public not only about the structures and traditions they see, but also about the various contexts they cannot see, imaginative off-site programs play a necessary and appropriate role in enhancing public awareness and appreciation of Pinelands history and culture.

Opportunities for creating historical signs, brochures and tours are limited only by the interpreter's imagination, although finances will prevent every interpretation project from being undertaken at once. Just as the Pinelands Interpretation Committee met to outline an agenda for regional Pinelands interpretation, each township can convene representatives of local historical societies, nature clubs and public schools to plan future local interpretation projects and to cooperatively pursue the funding needed to implement their plans. Municipalities can be sure of the support of federal, state and county agencies as well as the Pinelands Commission in bringing their interpretation ideas to reality. In the long run, such regional and local interpretation efforts can help to build a lasting and broad-based constituency for the protection of Pinelands cultural resources that will not only enrich public understanding of existing sites, but also help to protect those sites in the future.

APPENDIX A

GUIDELINES FOR THE DEVELOPMENT OF COMPREHENSIVE MUNICIPAL INVENTORIES

BACKGROUND

A comprehensive municipal inventory (CMI) is ideally a listing of all the areas and sites of cultural significance within a township's boundaries as well as a determination of areas of no cultural significance. The culturally significant sites should include both structural and archaeological remnants and should comprise both the prehistoric (American Indian) and the historic (i.e., post 1600 A.D., when European settlement of New Jersey began) periods. Such a listing would be an invaluable aid for public education as well as for planning purposes. However, it would be extremely difficult to compile, if indeed it were to account for all the areas used and/or occupied by humans at any time in the past. A truly comprehensive inventory would require extensive subsurface testing to ensure that all loci of historic and prehistoric activity within a municipality have been identified. This testing would involve auger clusters or posthole excavations, with the spoil being sieved to retrieve small artifacts. Obviously it is impractical to test an entire township in this manner at the intervals (100 ft. maximum) currently recommended for cultural resource surveys.

For this reason, the Pinelands Commission has drafted guidelines for the development of comprehensive municipal inventories which are affordable, but which still provide definitive information as to the status of historic period resources at a development site. For municipalities within the Pinelands Area, this information would be useful to local review agencies which must decide when to require a cultural resource survey pursuant to proposed development. The Commission's guidelines are not designed to address the incidence of prehistoric site occurrence within a municipality. Because these sites are relatively invisible and undocumented, their detection and management require a different approach, which is discussed later (see p.4). In the context of these guidelines, the terms "historic" and "historic period" will refer only to resources which postdate 1600 A.D. and not to those reflective of Native American culture.

PURPOSE AND DESCRIPTION

The Pinelands comprehensive municipal inventory is meant to be used by a town principally in its development review and permitting capacity. As referenced in the Pinelands Cultural Resource Management Plan for Historic Period Sites, a CMI involves an investigation of the extant historic resources of a municipality at sufficient intensity to be able to make informed decisions about their presence or absence in areas proposed for

development. Although it is strongly recommended, municipalities are not required to complete a comprehensive municipal inventory. The CMI is intended as an option available to towns that wish to facilitate the evaluation of cultural resources for projects subject to Pinelands Commission review.

Since the inventory is targeted for use in permitting, detailed information about the history of each site uncovered, though desirable for public education programs, is not necessary. Sites identified in the inventory as being of possible significance can be more intensively researched at a later date, either when development is proposed (and a cultural resource survey is required as part of the development application) or as a student research project included as part of a social studies curriculum.

A CMI developed along the Commission guidelines will provide two types of information:

- a list of all known historic period sites of definite or possible significance
- a determination as to the status of historic resource information in every area of a township.

The inventory listings must include all sites which are potentially significant (a significant site is one eligible for Pinelands Designation and the National Register of Historic Places), not just those which have already been evaluated and either Designated or judged eligible for Designation. The inventory will also result in a grouping of all portions of a municipality (except, at local option, publicly held lands not subject to development) into one of five categories. These categories rank areas according to the amount of information available about the presence or absence of historic resources. Places where Designated sites occur or there is a high potential for significant resources are placed in either Category I or II, while areas possessing modern or historically inconsequential sites will likely be ranked in Categories IV or V. With these rankings municipal officials will be able to tell at a glance those lots which should be surveyed before development can proceed.

COMPREHENSIVE PLANNING FOR PREHISTORIC SITES

The CMI guidelines are designed solely for historic period sites because of the greater difficulty and expense involved in inventorying prehistoric sites. Native American sites are usually represented by no more than a scattering of lithic artifacts at the surface, which are themselves only recognizable to the trained eye. Although the Pinelands Commission maintains an inventory of previously reported American Indian sites, it is not sufficiently comprehensive for use in development review decisions. Since this inventory represents an unsystematic collection and is biased in favor of developed areas over undeveloped, clearings over forested tracts, stream banks over upland divides, etc., it cannot accurately reflect the true incidence of prehistoric site occurrence throughout the region. Many of the less accessible areas of the Pinelands and those intuitively judged by collectors to be less likely to yield artifacts have never been subjected to more than a cursory review.

The most effective and economical means of gaining reliable data on prehistoric site locations is through development of a predictive model. Such models have been effectively employed in many parts of the country to predict the likelihood of site occurrence over large areas. They generally are designed to identify various environmental factors and micro-environments in a test area and then, through random sampling of these settings, determine those that are most often associated with aboriginal site locations. From the initial results of this limited testing the likelihood of site occurrence is postulated for the entire region. These projections are themselves tested over time to determine their accuracy.

Pinelands municipalities are encouraged to undertake predictive model surveys, either individually or jointly with neighboring towns. A well executed model would allow planning boards to make quick and reliable decisions about the need for a survey at development sites; it would also provide information useful in public school programs for teaching children about their rich and very ancient heritage. Partial funding for models is available through U.S. Department of the Interior Historic Preservation Fund matching grants, administered by the Office of New Jersey Heritage (New Jersey Department of Environmental Protection). The expense of a model can be further defrayed through joint sponsorship by several adjoining municipalities. Testing over a large area is more efficient and would significantly reduce the cost per township.

The Pinelands Commission is presently studying the feasibility of developing a predictive model for the entire Pinelands Area. A long-term work plan for a regional model has been developed and the Commission will begin implementation of phase I of the model in 1988. However, the model itself will likely not be completed anytime soon, given funding limitations and the enormous area involved. In the absence of the model, development review decisions regarding the need for site specific surveys will continue to be made by the Commission on a case-by-case basis. Municipalities that may wish to streamline this process should seriously consider undertaking a model on their own.

EFFECT OF A COMPREHENSIVE MUNICIPAL INVENTORY

Although it is not required for conformance with the Comprehensive Management Plan, development of a CMI presents advantages to a municipality. An inventory which is certified by the Pinelands Commission allows a municipality to make essentially a final decision as to the need to survey for historic sites prior to beginning development in the Pinelands Area. Once a strategy is adopted for the protection of prehistoric sites via a predictive model or a full scale survey, a municipality will have all the tools necessary to make a definitive decision regarding survey requirements without having to consult the Commission. Although the Commission retains its review and "call-up" powers, a bona fide decision based on the inventory should be accepted by the Commission. This expedited review process should make towns with a certified CMI more attractive to developers.

A CMI completed according to the guidelines enumerated below can be accomplished without undue cost to a municipality. Much of the time consuming work, such as an initial listing of extant historical structures, can be done by volunteers (with a short training session) or by a local

historical society. The end result will be a compendium of known sites and historically sensitive and non-sensitive areas that is directly translatable to development review decisions. The inventory will also be useful should the municipality choose to participate in the state Certified Local Government (CLG) program or to seek grants or revolving loans through the New Jersey Historic Trust. The Trust funds are dedicated to rehabilitation of historic buildings or for infrastructure work in designated historic districts. The CLG program qualifies towns for further federal grant moneys for historic preservation projects (information on these funding sources is available from the Office of New Jersey Heritage, CN 404, Trenton, NJ 08625).

COMPREHENSIVE MUNICIPAL
INVENTORY GUIDELINES

GENERAL REQUIREMENTS

1. Access to information on archaeological site locations must be restricted in order to prevent looting of sites.
2. Inventory information must be compiled on New Jersey State Inventory forms (available from the Pinelands Commission or the Office of New Jersey Heritage).
3. The inventory must be reviewed and updated biennially.
4. The inventory must include an assessment of imminent and probable threats to the resources identified.
5. The inventory must include a classification of each resource identified with reference to the resource groups contained in the Pinelands Cultural Resource Management Plan for Historic Period Sites (CRMP).
6. The inventory must list all identified resources by block and lot and must include maps at an appropriate scale which indicate the locations of all resources.
7. The inventory listings must be compiled and presented according to the specific guidelines listed below and must be approved by the Pinelands Commission.
8. The inventory must be compiled under the general direction of an individual who meets the relevant standards in the federal "Qualifications for Professionals" (36 CFR 61).

GUIDELINES FOR COMPILING THE INVENTORY

A comprehensive municipal inventory comprises a survey (background documentary research and field investigation) of cultural resources and a report detailing the results of that survey. Before beginning the field portion of the survey, a town should openly advertise the fact that crews will shortly be out recording resources. This will allay any fears of residents about strangers taking notes on their property and may also encourage individuals to come forward with historical information. It would also be advisable to issue temporary identification cards to the field crews.

The survey must include the following:

1. Sufficient background research on the natural environment (i.e. soils, vegetation, drainage, topography, land use, geomorphology, etc.) to allow predictions to be made about:
 - a. the general nature and distribution of expected cultural resources (e.g., what environmental factors may have influenced site distribution?);

- b. the kinds of expertise and methods required to locate, identify, record, and evaluate the potential cultural resources in the area, based on known environmental factors; and
- c. the relationship between the study area and its regional environmental setting.

Much of this information is available from various reports prepared for the Pinelands Commission.

2. Documentary background research on historic and architecturally-historic properties in the project area, to develop a concise, historical analysis of the study area, including an identification of historic and social factors which influenced the development of the area, and a discussion of general historic values and data categories to be expected for this area. This research should include:

- a. a thorough search through the National Register of Historic Places (NRHP), the New Jersey State Register of Historic Places (SRHP), the New Jersey Historic Sites Inventory, the New Jersey Indian Site Survey, the Pinelands Commission Cultural Resource Inventories, the Annotated Bibliography of Cultural Resource Survey Reports Submitted to the New Jersey State Historic Preservation Officer, and site files of local researchers and educational institutions;
- b. a search for maps, photographs, and drawings relevant to the study area;
- c. a review of ethnographic and ethnohistoric works, historic studies, architectural papers, etc., which might yield information on the study area; and
- d. investigation of primary historic accounts such as diaries, journals, letters, newspapers, and papers of persons associated with the study area.

3. Archaeological (prehistoric and historic) background research, to include:

- a. a thorough search through the NRHP, the SRHP, the New Jersey Historic Sites Inventory, the New Jersey Indian Site Survey, the Pinelands Commission Cultural Resource Inventories, the Annotated Bibliography of Cultural Resource Survey Reports Submitted to the New Jersey State Historic Preservation Officer, and site files of local researchers and educational institutions;
- b. a thorough investigation of published reports, journals, and papers on archaeological resources previously identified and studied in the project area;

- c. contact with nonprofessional and professional archaeologists who have experience working at archaeological sites or with archaeological data from within the study area;
 - d. an understanding of the special kinds of methods and expertise which would be useful in the field.
4. A thorough "windshield" survey of the entire municipality at a sufficient level of intensity to:
- a. identify current development patterns throughout the municipality and to define general areas presently devoted to a single activity or to related activities (e.g., residential areas, commercial areas, agricultural areas, industrial areas, etc.);
 - b. identify anomalies (areas altered by cultural activity) which are not documented in the historical record; and
 - c. record on state inventory forms all sites or structures of possible historic, architectural or engineering significance
5. A complete pedestrian surface inspection of all anomalies identified in the windshield survey and all other areas of the township not otherwise accessible.
6. Evaluation of results, to include:
- a. types of data categories and cultural values thought to be present;
 - b. the cultural, functional and chronological relation of sites within the municipality to each other;
 - c. significance of cultural resources in terms of NRHP criteria (36 CFR Part 800.10) and Pinelands Designation standards (N.J.A.C. 7:50-6.154); and
 - d. importance of resources in terms of their regional and cultural setting.

GUIDELINES FOR THE FINAL REPORT

The final report/inventory should reflect the results of the documentary research and field investigation and must include:

- 1. a description of the areas examined, including but not limited to: soils, vegetation, drainage, land uses, present conditions, topography, historic and prehistoric sites, architecturally-historic properties and engineering resources;
- 2. a description of the survey research design and fieldwork methodology,

with an evaluation of the effectiveness of the survey and a discussion of any conditions which affected the survey (e.g., weather, access to study area, density of ground cover, etc.);

3. a discussion of the regional cultural and natural environment, including the comparative cultural relationships of sites in the municipality to each other.
4. identification of all reported cultural resources according to the resource groups contained in the CRMP and an inventory of known or suspected cultural resources of significance in the municipality, to be completed on state inventory forms, arranged in a clear and reasonable format and keyed to the map(s) described below;
5. a map or maps at appropriate scale, identifying all the cultural resources in the municipality according to the five categories described below.
6. an evaluation of the potential significance of each identified resource and an opinion as its eligibility for the National Register and for Pinelands Designation;
7. based principally on the municipal master plan and zoning ordinance, an analysis of the potential impact of anticipated development on the municipality's resource base as well as a discussion of what the loss of part or all of these resources will have on present and future public appreciation and/or scientific investigations;
8. a complete listing of all references and sources consulted in the course of conducting the survey and preparing the report (including documentary research, fieldwork, etc.);
9. names and professional qualifications of principal individuals associated with the survey (including those involved with the documentary research, fieldwork, report preparation, etc.).

In order to facilitate development review decisions, the final inventory and report must also reflect a determination that each site or area identified in the survey falls under one of the five following categories:

- Category I - Sites/areas possessing resources that are on or have been determined eligible for the State or National Registers or that have been locally or Pinelands designated.
- Category II - Sites/areas possessing resources of possible, but as yet undetermined, significance (as defined by the criteria for Pinelands Designation).
- Category III - Areas where access was not gained because of owner objection and thus the historic potential is undetermined.

Category IV - Sites/areas not eligible for Pinelands Designation or the National Register, but possessing a cultural remnant reflective of patterns of land use and requiring minimal recording.

Category V - Sites/areas where there is no evidence of a cultural activity or none that requires further documentation.

If a municipality desires for its own purposes (such as public education or identification of an historic district), it may further subdivide these categories (particularly the first two categories) to gain a more precise accounting of extant resources. For instance, if a Category I area is identified which is eligible for historic district designation, the inventory could list buildings within the proposed district according to their relative significance, e.g., "critical," "contributing" and "non-contributing." This would also further facilitate development decisions.

Once all the local cultural resources have been categorized, the municipality can make quick, informed decisions as to the need for a cultural resource survey at development sites according to the following formula:

CATEGORY OF
RESOURCE

REQUIRED TREATMENT

Category I - No survey required since significant resources have already been documented; follow appropriate treatment prescriptions contained in the CRMP.

Category II - Require a cultural resource survey.

Category III - Conduct a site inspection or request the Pinelands Commission to determine if a survey should be required.

Category IV - Waive the survey requirement, but require recording of the resources according to the guidelines in the CRMP.

Category V - Waive the survey requirement.

These inventory guidelines have been designed specifically to avoid the need for archaeological testing, a costly and time consuming process. Once the initial inventory has been compiled, a municipality may desire to reduce the number of areas subject to a cultural resource survey because of uncertainty (Categories II and III), particularly where development is likely in the near future. In those cases, the town may choose to undertake "Stage I" archaeological testing of selected areas in order to gain more concise information about their cultural resource status. As defined by the Office of New Jersey Heritage, a Stage I survey "includes subsurface testing to identify the presence or absence of archaeological resources and provides general descriptive information about potentially significant historic and architectural properties."

Portions of a township under public ownership where no development is ever anticipated may be excluded from the survey, but the inventory must specifically identify these areas. Of course these tracts may be subject to an individual survey at a later date if they are opened for development. This provision is essentially intended for large, open areas such as state forests rather than for small municipal lots. The inventory would be difficult to administer and would not be truly comprehensive in scope if a series of small lots were excluded.

For further information on inventories, surveys and cultural resource management, see "Guidelines for Local Surveys: A Basis for Preservation Planning," National Register Bulletin No. 24 (Reissued 1985), published by the U.S. Department of the Interior, National Park Service (available from the Office of New Jersey Heritage).

APPENDIX B

GUIDELINES FOR CULTURAL RESOURCE SURVEYS

The following guidelines have been drafted in order to comply with Subchapter 6, Part XV of the Pinelands Comprehensive Management Plan (N.J.A.C. 7:50-6.151 et seq.), which controls treatment of historic and prehistoric resources on development sites. The guidelines complement the recently revised Guidelines for the Preparation of Cultural Resources Management Archaeological Reports Submitted to the Office of New Jersey Heritage (ONJH) and thus contribute to a uniform state wide policy for the protection of the physical remnants of our national heritage.

The Comprehensive Management Plan requires that a cultural resource survey accompany all applications for development in a Pinelands Town or Village and all applications for major development elsewhere. However, many of these applications propose development in areas with little or no potential for significant historic resources. For this reason the Commission reviews all such applications to determine if the survey requirement should in fact be imposed. An applicant may also request a Letter of Interpretation (pursuant to N.J.A.C. 7:50-4.71 et seq.) as to the need for a survey at a development site.

If no resources are found or judged likely to be present, the requirement for a survey may be waived. However, if the preliminary review suggests an historic site may be affected by the project, a cultural resource survey, conducted according to the guidelines enumerated below, is required.

The intent of a survey is to determine whether any sites eligible for Pinelands Designation (N.J.A.C. 7:50-6.154) occur within a project area and, if so, to recommend means to eliminate or mitigate any impact the development would have upon them. If any resource of possible significance is uncovered initially, the survey must be continued at what is often referred to as a "phase II" level of documentation. Surveys, particularly those performed in advance of large scale public development projects, are often conducted in two phases according to the intensity of documentary research and field testing undertaken. According to ONJH, a phase I survey "includes subsurface testing to identify the presence or absence of archaeological resources and provides general descriptive information about potentially significant historic and architectural properties." A phase II survey "entails more extensive archival research and field investigations for the explicit purpose of evaluating the integrity, boundaries, and significance of cultural resources in terms of their eligibility for inclusion in the National Register."

In order for a development application to be deemed complete by the Commission, the survey must ultimately be carried out at the phase II level of documentation if any cultural resources of possible significance are found. Sufficient information must be submitted to allow

for an independent assessment of the eligibility for Pinelands Designation, the Commission's equivalent of the National Register, of any resources uncovered and the boundaries of any resources deemed eligible. At the applicant's option, a phase I level survey may be carried out initially in order to gain general information about the intensity of prehistoric and historic occupation of a project area. However, this is not usually advisable since a phase II survey will still be necessary for issuance of a certificate of filing (presuming of course that the phase I survey uncovers possibly significant resources). Splitting the survey into two stages could well result in additional expenses to the applicant, particularly when this results in submission of two separate reports. To keep costs to a minimum, applicants and preservation consultants should contact the Commission for guidance when the initial survey work indicates the presence of a potentially significant resource.

A professional survey of cultural resources (including prehistoric and historic archaeological sites and elements of the built environment that are of architectural, social or historical significance) must be conducted by qualified individuals. Principal investigators must meet the standards set forth in the Secretary of the Interior's Standards for Archaeology and Historic Preservation (36CFR61). This generally means that the individual in charge of conducting a survey must have a graduate degree in an appropriate field and at least two years of applied experience. The Pinelands Commission and ONJH maintain lists of individuals and firms who perform cultural resource surveys. The lists are available upon request.

The following survey guidelines are in the form of a report format with guidance for completing each section. Strict adherence to this format is a prerequisite for approval of any cultural resource survey submitted to the Commission. The information compiled during a survey must be organized and presented precisely according to the headings and subheadings and in the order shown below. Survey reports which do not conform to this format will not be accepted. This uniform reporting format will allow for a more expeditious review by the Commission and other agencies, greater ease of data entry for the Commission's computerized cultural resource inventories and more effective use of the surveys by future researchers. More importantly, the standardized format will help to ensure that all the historic and prehistoric resources of the Pines are correctly recorded before they are disturbed or altered.

Guidance as to the proper types of information that should be contained under each heading is included in the guidelines. Each heading/subheading must be fully addressed in every report and an entry must appear for each. Although there may be little or no data available for some headings, this fact may itself be useful information (negative evidence can be valuable evidence) and, in any event, it indicates to future researchers that the topic was explored and resolved as part of the survey.

REQUIRED REPORT FORMAT FOR CULTURAL RESOURCE SURVEYS SUBMITTED TO THE
PINELANDS COMMISSION

COVER PAGE

A Cultural Resource Survey of (Historic or modern name of site and
street address, if appropriate), Block _____, Lot _____,
Township, _____ County, New Jersey Pinelands Development Application

(Principal Investigator)

(Firm)

(Firm's Address)

(Date)

SECTION I. Abstract

- A. Project type, location (including UTM and State Plane coordinates) and size
- B. Field and documentary research methods
- C. Results
- D. Evaluation, impacts and recommendations
- E. Location of report copies

(GUIDANCE - The abstract should serve as a brief, one-half to one page maximum, summary of the survey, with an emphasis on the results, the evaluation of resources uncovered and the recommendations for treatment).

SECTION II. Table of Contents

SECTION III. Lists of Figures, Plates and Tables

(GUIDANCE - Figures, plates and tables must be incorporated into the text on the page following the citation; they may not be appendices. The lists must reference the page number on which the illustration or table may be found.

Particular care must be taken to ensure that photographs of structures and their historic environs adequately and accurately record the subject. The photorecording of structures should be approached in the same manner as the narrative recording, i.e., it must be a systematic, logically sequential presentation that documents the

entire exterior, as well as any unusual, diagnostic or otherwise significant elements of the interior. Submission of a few random, disjointed photos that do not thoroughly record a building's appearance will not be acceptable. Photorecording must be completed in a manner that enables a reviewer essentially to "reconstruct" the structure and envision it in its surroundings. In most cases this will involve three categories of presentation:

- "panoramic" photos, taken from a distance in order to provide overview and situational context; such photos are particularly important if the environs are associated with and contribute to the structure's significance [i.e., historic landscapes, such as an intact farmstead];
- exteriors, which adequately display all sides of the structure; and
- interiors and details, which should also document any features referenced in the narrative.

Multiple buildings in a complex must be further recorded through one or more photos that demonstrate their location and spatial relationship. Very minor buildings in a complex [tool sheds, modern garages, etc.] must be documented but, at the consultant's discretion, may be recorded by a single photograph.

Correct photorecording is a critically important aspect of a cultural resource survey which requires professional equipment. The use of wide angle or telephoto lenses may be necessary for proper documentation.

The following specific standards apply to all maps, photos and figures submitted as part of a survey:

1. Original black and white photos must be included which depict: all buildings and structures on site from as many angles as is necessary for thorough documentation; any unusual, diagnostic or otherwise significant structural details, particularly any that are referenced in the text; all features of archaeological significance; representative and diagnostic artifacts.
2. Photos must be a minimum of 3 "X 5" in size; 5" X 7" or larger photographs are preferred and may be necessary for the purpose of clarity. Photograph titles for site overviews must include direction or orientation. For larger projects, photograph location should be keyed to a site map. Photographs of features, etc., must include scale, title board and orientation; photos of artifacts must include a

scale. All photographs must be captioned and the caption should include the date of exposure.

3. All copies of modern maps must include a north arrow, accurate scale, delineation of the project area, legend, map title and year of publication. Reports must include the project area accurately delineated on a U.S.G.S. 7.5' topographic map and a county soils survey map, if available for that area. A map showing the project area in relation to New Jersey's physiographic provinces is recommended. Historic maps must include a north arrow, map title, year of publication and accurate scale, if possible.
4. Floor plans must be submitted for historic buildings or structures which: were residential in character; housed a function which helped to define a historic land use pattern; or otherwise reflected a technological advance or significant social, ethnic or economic conditions in the past. The plans must be submitted regardless of the structures' eligibility for Pinelands Designation. Consultants who are uncertain as to the need to submit floor plans in specific instances should contact the Pinelands Commission. The following specific standards apply:
 - a. Floor plans must be at sufficient scale to be clearly reproduceable and to allow for easy identification of significant details.
 - b. All room divisions must be shown and the function of each room labelled.
 - c. The locations of all windows and doors as well as any unusual, functional and/or diagnostic elements of significance must be shown.
 - d. Physical evidence of earlier room divisions or significant prior uses [e.g., drill holes for machine mounts, wear patterns for former use areas, etc.] must be represented and labelled as such.
5. An archaeological base map must be submitted for any survey that included subsurface testing. The map must be at sufficient scale to clearly delineate and number each test unit and to accurately depict every major feature and structure and the boundaries of each resource eligible for designation; each unit where prehistoric or significant historic period materials were found must be distinguished on the map; all significant topographic features [stream courses, wetlands, periglacial features, engineering works, etc.] must appear on the map; contour lines

are recommended, but not required.

6. If the proposed development will affect a designated or eligible resource, the base map has to show the limits of development [buildings, roads, parking, landscaping, cleared areas, etc.] in relation to the resource. If this will result in an overly "crowded" map, details of the project design may be omitted at the consultant's option so long as the boundaries of the area to be developed are clearly delineated.
7. Figures of cross-sections and profiles must include scale, elevation, orientation, a description of soil colors [Munsell] and composition. These figures should be keyed to the site map).

SECTION IV. Regulatory Requirements

- A. Applicable federal regulations.
- B. Applicable state regulations.
- C. Applicable local regulations.

(GUIDANCE - List all the federal, state and local requirements governing historic resources that apply and/or the specific concern that prompted a survey. Consultants should be aware that most of the municipalities of the Pinelands have revised their land use ordinances to include specific provisions for the protection of cultural resources. Examples of acceptable statements:

- "Required by the Pinelands Commission pursuant to N.J.A.C. 7:50-6.155 and by the Office of New Jersey Heritage pursuant to Section 106 of the National Historic Preservation Act [36CFR800] because of [topographic indicators often associated with prehistoric sites; anomaly indicative of possible site; prehistoric sites in the vicinity, etc.]"
- "Requested by [client/agent] in anticipation of a survey requirement by the Pinelands Commission. The survey is intended to detect the presence of historic or prehistoric loci, but in particular has been prompted by [the specific historic/prehistoric concern that affected the survey strategy]".

SECTION V. Natural Resource Information

- A. Natural resource inventory
 1. Soils series that are present.

2. Topography of the project area, including any man made alterations.
3. Vegetation.
4. Hydrology.

(GUIDANCE - Soil series information is available from the county soils surveys. The topography of the project area may be adequately documented with a detailed contour map. An accurate site plan depicting surface water courses and wetlands is sufficient to record the hydrology).

- B. Narrative description of the project area and its environs, including both the natural and the built environment.

(GUIDANCE - This section will vary in length and scope depending on the area being surveyed, but it must be a detailed description of the natural conditions that exist within a project area. The purpose of this research is to allow reviewers to assess:

- the general nature and distribution of expected cultural resources [e.g., what environmental factors may have influenced site distribution];
- the kinds of expertise and methods required to locate, identify, record, and evaluate the potentially eligible cultural resources in the area, based on known environmental factors; and
- the relationship between the study area and its regional environmental setting).

SECTION VI. Results of Background Documentary Research

- A. Documentary research into prehistory

1. List of sources consulted.

(GUIDANCE - A series of standard references that at a minimum must be reviewed for all projects is found on pages 262 and 263).

2. Summary of all known sites within a two mile radius of the project area.
3. Narrative statement summarizing the research results.

(GUIDANCE - The documentation of sites in the vicinity is intended to provide an overall picture of known prehistoric utilization of local resources,

particularly as this relates to the project area and the likelihood of exploitation of the same or similar resources. A simple "laundry list" of nearby sites will not suffice. Consultants should also take care not to divulge precise site locations. The narrative statement must address at a minimum the following topics:

- a. the relationship of known sites in the vicinity to the project area [i.e., environmental and topographic similarities between the site locations and the project area];
- b. an assessment of the environmental setting in the project area and its likelihood [or unlikelihood] to be associated with pre-historic sites; and
- c. a discussion of how the results of the documentary review affected the field survey strategy).

B. Documentary research into the historic period

1. List of sources consulted.

(GUIDANCE - A series of standard references that must be reviewed for all projects is found on pages 262 and 263.)

2. Summary of all known sites within a one mile radius of the project area and a general summary of historical development in the vicinity of the project area.

(GUIDANCE - Consultants should take care to avoid generalized "boilerplate" historical synopses. The purpose of this summary is to identify those specific factors or activities which may have influenced the historical development of the project site).

3. Summary of documentary research specific to the project area.
4. Discussion of how the results of the documentary review affected the field survey strategy.

SECTION VII. Description of Field Survey

A. Method of surface inspection

1. Conditions affecting surface inspection.

(GUIDANCE - This is meant as an assessment of the effectiveness and the limitations of the surface inspection in initially identifying cultural resources. Natural or man made conditions that affected the reliability of the surface inspection - snow cover, dense ground vegetation, field crops, etc. - should be fully discussed and their effect on the survey evaluated).

2. Delineation of any areas not inspected and justification.

3. Results of surface inspection.

(GUIDANCE - A full description of any anomalies, alterations, clearings or other evidence of possible occupation or use is required, as well as a discussion of any environmental settings that may have attracted prehistoric peoples. Areas of low potential for site occurrence should also be identified).

B. Description of subsurface testing

1. Controls.

(GUIDANCE - This will be a standard description of the methods employed in the field testing - posthole/auger/test square; diameter of test pits; total number of tests; average depth of tests; testing intervals; method of screening. The total number of test units undertaken during the survey should also be noted).

2. Size and description of field crew.

3. Test pattern and justification.

(GUIDANCE - This section is intended as an explanation and description of the test pattern selected and a justification for it. The justification should be essentially a preliminary research design; it must be based on and specifically reference the evidence of the natural resource assessment, the background documentation, the surface inspection and the development plans. The field testing should incorporate a rational and defensible probabilistic sampling approach and not simply reflect intuitive judgments as to likely site and non-site locations. Modification to the testing strategy due to the initial results should also be addressed. The justification must account for the areas not tested as well as for areas tested. Areas which were more intensively surveyed [because of the presence of a cellar hole, relict periglacial

feature, etc.] should be discussed here, as should areas which were not surveyed [because of wetlands, a formal buffer delineation, massive disturbance such as a gravel pit, etc.] This rationale must be specific to the project area; consultants should avoid the use of perfunctory, generic statements, e.g., "Testing was conducted near all stream courses...").

C. Description of architectural recording

1. Conditions affecting recording.

(GUIDANCE - Any conditions which affected or limited the scope or thoroughness of the recording process, e.g. structural deterioration that prevented access, must be described and their impact on the evaluation of the resource must be assessed).

2. Level of recording.

(GUIDANCE - This will be a brief description of the methods by which a structure was recorded [measured drawings, photo prints, slides, narrative description, etc.]. The level of effort must also be described, e.g., the consultant must state whether any effort was made to remove modern veneers to expose older elements and whether any fabric was removed in order to examine framing or other construction details).

SECTION VIII. Survey Results

A. Description of cultural resources encountered

1. Description of each discrete feature/resource and associated artifacts.

2. Assessment of relationship of features/resources to each other.

(GUIDANCE - This must be a full and complete description of each resource in its cultural context. For archaeological sites this will of course also entail a thorough and comprehensive description and analysis of associated artifacts and ecofacts in their stratigraphic context. The artifact recordation should include at a minimum:

a. Detailed descriptions and results of analytical methods used. Definitions of individual typological or other systemic categories [e.g., "interior flake"] should be provided with the pertinent specific references. A summary of these analyses may be used if the details are

provided as an appendix;

- b. Original photographs of selected or representative artifacts, including scale. Accurate drawings of artifacts, particularly prehistoric lithics, may also be necessary in some cases in order to highlight diagnostic characteristics. A complete inventory of artifacts by provenience and class must be included as an appendix;
- c. Tables or other summary information;
- d. Rationale for artifacts not collected or later discarded; and
- e. Identification of artifact collection repository and location of project notes.

For architectural sites the recording must be complete and detailed, with a systematic description of the basic style, dimensions, building materials, details [windows, doors, chimneys, roof construction details, etc.] floor plans, etc. Any features remaining within a building indicative of functions, processes, activities, technological advancement, ethnicity or social or economic status, as well as any unusual or idiosyncratic features, must be fully recorded).

B. Relationship to Pinelands Cultural Resource Management Plan for Historic Period Sites (CRMP)

1. Resource group attribution of historic period resources.

(GUIDANCE - The CRMP divides the known historic period resources of the Pinelands into nine functionally related grouping called "resource groups" and provides very specific measures for evaluating and treating resources within each group.

Each resource identified during the course of a survey must be reviewed to determine the resource group or groups to which it belongs and a brief explanation of the resource group attributions must follow. If it does not belong within any of the groups, this must be noted. Residential sites must also be categorized according to the styles listed in the "Residential Architecture" subchapter of Chapter IV of the CRMP. If none of the categories applies, this must be noted).

2. Determination as to Pinelands Designation eligibility.

(GUIDANCE - Resources must be evaluated as to their historical significance according to the four criteria for Pinelands Designation, which are essentially identical to those used for the State and National Registers. The survey report must reflect a thorough evaluation of each identified resource according to all four criteria. If a resource is judged to be eligible for designation, the criterion/criteria which apply[ies] must be specifically referenced.

The evaluation must also result in a determination that each identified resource falls into one of four categories of significance:

- a. Pinelands Designated resources
- b. Significant resources
- c. Sufficient remains
- d. Insufficient remains

These categories are defined and explained in the CRMP).

3. Recommended treatment measures.

(GUIDANCE - The level of treatment required for an individual resource depends on the category of significance to which it is assigned. "Designated" and "Significant" [i.e., eligible for designation] resources must be preserved in place if possible according to the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. Sites with "Sufficient Remains" must undergo a simple recording process [photos, brief narrative description, completion of a New Jersey State Inventory form], which is completed as part of the survey report. Sites with "Insufficient Remains" require no further documentation).

SECTION IX.

Sources

(GUIDANCE - Sources not otherwise listed in Sections VI A.1. and B.1. may be compiled into one list; they should include, but not necessarily be limited to, those listed below).

- A. References cited and consulted (current American Antiquity format).
- B. Maps.
- C. Archival documentation.
- D. Personal communication from informants, including

oral histories.

E. Pertinent project correspondence.

SECTION X.

Appendices

A. Qualifications of principal investigator, field director and laboratory supervisor.

B. Soils log for each test.

C. Artifact inventory by provenience.

(GUIDANCE - For each artifact the entry must include at a minimum the test unit, the stratigraphic/arbitrary level designation and a brief identification).

D. New Jersey State Inventory forms.

(GUIDANCE - A form must be filled out for each architectural resource).

E. Data entry forms.

(GUIDANCE - A data entry form must be completed in full for each historic or prehistoric locus identified in the survey).

STANDARD REFERENCES TO BE CONSULTED

This is a basic list of standard references which must be consulted at a minimum in order to meet the survey guidelines. Reference to other sources will undoubtedly be required to complete the historic documentation at individual project sites.

Bello, Charles (editor)

- 1986 Bulletin of the Archaeological Society of New Jersey: Index, Bulletin No.1, 1948 through Bulletin No. 40, 1986. The Archaeological Society of New Jersey, Seton Hall University, South Orange, NJ

Chesler, Olga (editor)

- 1982 The Paleo-Indian Period to the Present: A Review of Research Problems and Survey Priorities. New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of New Jersey Heritage, Trenton.

- 1984 Historic Preservation Planning in New Jersey: Selected Papers on the Identification, Evaluation, and Protection of Cultural Resources. New Jersey Department of Environmental Protection, Division of Parks and Forestry, Office of New Jersey Heritage, Trenton.

Cross, Dorothy

- 1941 Archaeology of New Jersey vol. I. Archaeological Society of NJ.

Moonsammy, Rita, David Cohen and Lorraine Williams

- 1987 Pinelands Folklife: Available from the New Jersey Historical Commission, Trenton

New Jersey Department of Environmental Protection

- 1979-1985 Annotated Bibliography: Cultural Resource Survey Reports Submitted to the New Jersey State Historic Preservation Officer. 5 vols. Division of Parks and Forestry, Office of New Jersey Heritage, Trenton. Reports submitted since 1985 are available for review at ONJH.

- 1984 New Jersey & National Registers of Historic Places as of December 31, 1984. Division of Parks and Forestry, Office of New Jersey Heritage, Trenton. An up-to-date listing is available for review at ONJH.

New Jersey Pinelands Commission

- 1980 New Jersey Pinelands Comprehensive Management Plan. New Lisbon, New Jersey.

- 1986 (revised 1990) Pinelands Cultural Resource Management Plan for Historic Period Sites. New Lisbon, New Jersey.

Ranere, Anthony and Patricia Hansell

1987 Predicting Prehistoric Site Distribution in New Jersey's Outer Coastal Plain. Division of Parks and Forestry, Office of New Jersey Heritage, Trenton.

Skinner, Alanson and Max Schrabisch

1913 A Preliminary Report of the Archaeological Survey of the State of New Jersey. Bulletin No. 9. Geological Survey of New Jersey, Trenton.

New Jersey Historic Sites Inventory, Historic Preservation Fund Survey and Planning Grants, Office of New Jersey Heritage, Trenton. County surveys are available for review at ONJH and the local government.

Pinelands Commission cultural resource inventories and surveys are available for review at the Commission offices.