

**COMMUNITY-WIDE
ARCHAEOLOGICAL RECONNAISSANCE SURVEY
OF BOLTON, MASSACHUSETTS**

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Artifact hobbyists are a major concern. The majority of these people make a hobby of collecting from archaeological sites for their personal enjoyment. These activities cause little harm when done in freshly plowed fields or other disturbed areas, but, unfortunately, are highly destructive when digging takes place within intact sites. The artifacts removed from the sites generally remain in private collections that are removed from public benefit. On the other side of the coin, there are unscrupulous collectors who remove artifacts for profit, and have no concern for the scientific nature of the materials. Their numbers are few, but the damage they create is enormous. Regardless of the intent, the target of all of these activities is the *artifact* and not the more important associations that allow a site to tell the story about its inhabitants. By removing the artifacts, and subsequently destroying the associations and context, the scientific and educational value of the site is irrevocably lost.

It is for this reason that federal and state legislation has been passed to limit the public availability of site locational information. Massachusetts General Laws, Chapter 9, Section 27C, for example, explicitly states, "Information reported to the state archaeologist pursuant to this section shall be regarded as confidential" and, further, "Any person, corporation, agency or authority of the Commonwealth or any of its political subdivisions supervising a survey, excavation or construction on any lands of the Commonwealth, its agencies or political subdivisions ... shall take all reasonable steps to secure its preservation."

This document is intended to be used for planning and research purposes by individuals, committees, or institutions involved in preservation efforts in Bolton. The information should not be made available to private individuals, public libraries, or other repositories with unrestricted public access. These include archaeological societies or clubs, scout troops, naturalist clubs, etc. While the information from the sites should be reported to the public for educational purposes, the actual location of the sites should be restricted on a "need to know" basis.

This document contains explicit site locational information. A set of maps showing site locations and areas of high site potential has been provided separately from this document for use in planning. All of these documents should be considered confidential.

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ABSTRACT

Archaeological Services at the University of Massachusetts Amherst conducted a community-wide archaeological reconnaissance survey of Bolton, Massachusetts. The project was conducted for the purpose of identifying previously recorded and potential cultural resource areas within the town. Data recovered during this survey are part of a management plan that is to be integrated with a local comprehensive plan for future town development.

The project included: 1) background research into the prehistoric and historic uses of town lands; 2) stratification of town lands into areas of low and high potential to contain cultural resources, based on topography, water sources, soils, and previously recorded sites; 3) a walkover inspection of selected previously recorded sites, and selected areas of high potential; 4) interviews with local informants and town personnel; and 5) integration of this information into a narrative of the town=s past, and development of a management plan for identified resource areas. At the start of the project, eight prehistoric sites (including collection areas) and thirty-two historic archaeological sites in Bolton were on record at the Massachusetts Historical Commission.

Many of the historic sites were included in forms for architectural resources or monuments, but had not yet been recorded as archaeological sites. Many of the site forms contained only partial information concerning the history and description, and condition of sites. Historic structures are generally assumed to possess associated archaeological deposits, and should be considered as sites although site forms may not yet exist for them. During the course of the project, one prehistoric site, one prehistoric locus, and ninety-nine historic sites were added to the record. Temporal and environmental information were added to all the sites. At the end of the survey, there were more than one hundred archaeological sites on record in Bolton. During the survey, approximately forty-six sites were visited.

The project concludes that Bolton contains many areas of high potential for prehistoric and historic archaeological sites. Most of these sites are in areas that have had limited disturbance. They represent a vital part of the town=s heritage, and have a high potential to contribute information of importance to archaeology.

There also are several historic industrial sites and house foundations in town that may be significant. Recommendations are made for protecting archaeological sites in the town.

MANAGEMENT SUMMARY

Archaeological Services at the University of Massachusetts Amherst completed a community-wide archaeological reconnaissance survey of the town of Bolton, Massachusetts. The study was conducted for the Bolton Historical Commission and the Massachusetts Historical Commission for the purpose of identifying previously recorded and potential cultural resources areas within the town. Data recovered during this survey are part of a management plan that is to be integrated with a local comprehensive plan for future town development.

The Town of Bolton has a wealth of historic and prehistoric archaeological sites within its boundaries. Some of the sites are derived from collections in agricultural areas and are partially disturbed. Residential development in Bolton has increased in recent years, and small housing developments, single-family homes, Title 5 septic facility upgrades, road widening, and similar construction projects having the potential to impact archaeological sites. It is recommended that the town establish a system of review designed to protect important archaeological sites.

The system would begin with a review authority through which proponents of construction apply for permits. The logical group in town would be the Bolton Planning Board. Using the site sensitivity map provided with this document, the Board can determine if a proposed construction site falls within a zone of high to moderate site potential. If it does, the project should be given to the Bolton Historical Commission for review. If the Historical Commission, using the site potential outlined in the survey units described in the report, soils maps, and historic maps, determines that a site may be significant, the advice of the Massachusetts Historical Commission should be requested. If through this process a site is determined to be significant, the proponent should be encouraged to modify project plans to avoid the site, and place it under a Site Preservation Restriction. The Site Preservation Restriction is a legal document in which the proponent agrees not to damage the site. If development were proposed in the future, archaeological survey could be required by the Commission. Compliance with Site Preservation Restrictions would be the duty of the Commission. If archaeological site preservation were not acceptable to the proponent, the survey requirement would apply.

The town should adopt regulations (possibly town by-laws) designed to protect archaeological sites from destruction through ground-alteration activities. (It is recommended that the town refer to the Standards and Criteria used by the Martha's Vineyard Commission as a model for development of a by-law for local review purposes.)

ACKNOWLEDGMENTS

The principal investigator and project archaeologists are grateful to many people for their generous assistance and enthusiasm regarding this community-wide reconnaissance in Bolton. Special acknowledgment is given to Donald and Pamela Anderson, residents of Bolton; Edward Bell, Staff Archaeologist, Massachusetts Historical Commission; Iris Berdrow, Local Project Coordinator and member of the Bolton Historical Commission; Harold Brown, Bolton Department of Public Works; Kelly Collins, Librarian, Bolton Public Library; Betsy Cussen, Town Clerk, Bolton; Linda Engelmann, Chairperson of the Bolton Historical Commission; Graham Entwistle, Photographer, *Bolton Common*; Dale Farrell, avocational archaeologist, Bolton; Timothy Fiehler, President, Bolton Historical Society; Rae Gould, Tribal Historic Preservation Officer, Nipmuc Nation, Sutton; Curtiss Hoffman, Archaeologist, Bridgewater State College; Cheryll Holley, Tribal Representative, Nipmuc Nation, Sutton; Ed Hood, Historian, Old Sturbridge Village; Eric Johnson, Staff Archaeologist, Massachusetts Historical Commission; Leonard Loparto, Staff Archaeologist, Massachusetts Historical Commission; Nathan Mayo, resident; Mary Ann McLeod, Massachusetts Archaeological Society, Sterling; Susan Miles, Assistant Town Clerk, Bolton; Kenneth Nicewicz, Bolton resident; Martha Pinello, Archaeologist, Strawberry Bank Museum, New Hampshire; Herbert Randall, resident of Bolton; Alice Roemer, resident; Gerald Smith, resident, Northborough; Michael Steinitz, Grant Manager, Massachusetts Historical Commission; and Ed Sterling, Chairman, Long Range Planning Committee, Bolton.

INTRODUCTION

This report presents the results of a community-wide archaeological reconnaissance survey of the town of Bolton, Massachusetts, conducted by the Archaeological Services at the University of Massachusetts Amherst for the Bolton Historical Commission. Funding was provided by the Bolton Historical Commission and the Massachusetts Historical Commission.

Background research was conducted from August 2000 through April 2001. Lands within the town were stratified into areas of low to high potential to contain prehistoric and historic sites, based on environmental characteristics and the previously recorded history of land use. Then, between February and April 2001, an archaeological field reconnaissance was completed of selected sites and areas of high potential to contain cultural resources. The walkover reconnaissance covered approximately forty-six sites.

Most of the staff of Archaeological Services are now or have recently been associated with the Department of Anthropology at the University of Massachusetts Amherst. Mitchell Mulholland served as principal investigator. The project archaeologists were Timothy Binzen (for historic resources) and Christopher Donta (for prehistoric resources). Margaret Kelly and Maureen Manning contributed to historical research and preparation of the report. The graphics were produced by Kathryn Curran. Jan Whitaker edited the final version of this report.

Archaeological Services conducts archaeological investigations in accordance with Federal and State legislation. Procedures are in compliance with legislation and regulations concerning the impact to archaeological properties from federally funded or permitted activities. These include the ANTIQUITIES ACT of 1906 (PL 59-209), the HISTORIC SITES ACT of 1935 (PL 74-292), the NATIONAL HISTORIC PRESERVATION ACT (PL 89-665, 16 USC 470, as amended), EXECUTIVE ORDER 11593 of 1971, the NATIONAL ENVIRONMENTAL POLICY ACT of 1969 (PL 91-190, 42 USC 4321), ADVISORY COUNCIL PROCEDURES FOR THE PROTECTION OF HISTORIC AND CULTURAL PROPERTIES (36 CFR VIII, Part 800), and the ARCHAEOLOGICAL AND HISTORICAL PRESERVATION ACT of 1974 (PL 93-291). State legislation dealing with the protection of historic and archaeological resources includes Massachusetts General Laws (Chapter 9, Sections 26-27C), the UNDERWATER ARCHAEOLOGY ACT (Chapter 989, Acts of 1973) and the MASSACHUSETTS ENVIRONMENTAL POLICY ACT (MGL, Chapter 30, amended by Chapter 947 of the Acts of 1977). Massachusetts archaeological permit regulations are outlined in 950 CMR 70.00.

In compliance with Massachusetts General Laws, Chapter 9, Section 27, Massachusetts State Permit 1976 was issued by Brona Simon, the State Archaeologist. Field data are stored permanently at the Archaeological Laboratory of the Department of Anthropology at the University of Massachusetts, Amherst.

AREA OF INVESTIGATION

Project Boundaries and Description

The project area consists of the entire town of Bolton, Massachusetts (Figures 1 and 2). It is depicted on the Boston, Massachusetts-Rhode Island-Connecticut, 1:100,000 quadrangle of Massachusetts (USGS 1989) (Figure 3).

Bolton is located in the central eastern section of the state of Massachusetts, in Worcester County. Bolton covers a total area of 51.8 square kilometers (20 square miles). The town is bordered on the west by the towns of Clinton and Lancaster, on the north by the town of Harvard, on the east by the town of Stow, and on the south by the towns of Hudson and Berlin. Bolton is accessed by Interstate 495, which runs in a generally north-south direction through the center of the town. Other access points include State Route 110, which runs through the northwest corner of the town; State Route 117, which runs primarily east-west through the center of the town; and State Route 85, which links Bolton with the town of Hudson on the southeast.

Environmental Context of Worcester County

Bolton is located on the eastern side of the New England Upland section of the New England Physiographic Province (Fenneman 1938:345). This section consists of a plateau or upraised peneplain that is divided by narrow valleys and also harbors occasional monadnocks (Fenneman 1938:358). The upland is typically about 300 to 330 m (1,000 to 1,100 ft) in elevation, with some higher peaks of exceptionally hard rock. The upland thus consists of an eroded plateau, sometimes called the Worcester Plateau, formerly consisting of more irregular terrain, but worn by many hundreds of millions of years of geological forces. The Seaboard Lowland section to the east and the Connecticut Valley section to the west form the borders of the central uplands, both lying for the most part at elevations of less than 60 m (200 ft). Elevations in Bolton are not as high as the central part of the uplands, as it lies along the eastern down-slope of the uplands, and is bordered on the west and east by the low Nashua River and Assabet River valleys. Elevations in Bolton vary from lows along the larger drainage bottoms of 66-72 m (217-236 ft), to peaks at hilltops of over 180 m (591 ft), including the highest point in the town, on Wataquadock Hill at 201 m (660 ft). Elevations are based on the National Geodetic Vertical Datum of 1929 (USGS 1979, 1997).

Geology. The bedrock foundation of central Massachusetts consists of bands of igneous and metamorphic rocks, oriented north to south (Johnson and Stachiw 1985:11). The Bolton area is known for its variety of rocks and minerals, a result of the town being underlain by both fine-grained crystalline slate-like rocks and crystalline granitic rocks. The eastern part of the Worcester plateau generally consists of crystalline granitic rocks, while the central part is largely composed of fine-grained metamorphics, such as phyllites and quartzites, and the western part is mostly granites and schists (Johnson and Stachiw 1985:12). Bolton lies at the transition between the central and eastern types of rock.

Soils. Bedrock typology has influenced the development of soils on the plateau, because soils are mostly the product of local bedrock weathering, with fewer areas formed in glacial deposits. However, soils in Bolton include both lowland areas, where soils have formed in floodplains and on outwash plains, and uplands, where soils have formed from bedrock weathering (Taylor and Hotz 1985).

Soils developed in outwash plains and stream deposits are optimal areas for supporting human settlements and cropland, and are expected to have the highest potential to contain archaeological sites. Outwash plains in Bolton are concentrated in the western part of the town along the Nashua drainage, but are also distributed across many of the smaller drainages in the central and eastern parts of the town.

There are several common soil types that are suitable for the establishment of Native American living sites. These soils are either well or excessively drained sandy soils, in the vicinity of a water source. These soils include Merrimack fine sandy loam, Hinckley sandy loam, and Windsor loamy fine sand. Areas suitable for prehistoric occupation range from level to about 15 percent slope.

Merrimack Fine Sandy Loam. This is one of the most prevalent soil types in Bolton. This soil is very deep, and is excessively drained. The soil is associated with glacial outwash plains throughout the town. The soil is well suited to cultivation, including cropland, hay, and pasture (Taylor and Hotz 1985). Merrimack soils are often associated with prehistoric sites where there is adjacent water, which is frequently the case.

Hinckley Sandy Loam. This soil is very deep, and is excessively drained. The soil is associated with glacial outwash plains throughout the town. The soil is well suited to cultivation, including cropland, hay, and pasture (Taylor and Hotz 1985). Hinckley soils are also often associated with prehistoric sites where there is adjacent water.

Windsor Loamy Fine Sand. This soil is very deep, and is excessively drained. The soil includes small areas associated with glacial outwash plains throughout the town. The soil is well suited to cultivation, including cropland, hay, and pasture (Taylor and Hotz 1985). Windsor soils are also often associated with prehistoric sites, where there is adjacent water.

Other well-drained soils are found in the town, but are usually located on slopes derived from glacial till and weathered bedrock. These include large areas of Paxton fine sandy loam, and Canton fine sandy loam. Other soils that are moderately well drained make up substantial sections of the town, and may contain Native American sites. These include Deerfield sandy loam, Sudbury fine sandy loam, and Winooski very fine sandy loam.

Drainage Systems. Bolton is located between the Nashua River and the upper section of the Assabet drainage systems. The Nashua River, and its major tributary, the Still River, both run through the northwestern section of the town. Other tributaries to the Nashua in Bolton include Bowers Brook, Forbush Brook, Runaway Brook, and several unnamed streams. The Nashua River flows northeasterly into New Hampshire, where it enters the Merrimack River. The Assabet River flows in a northeasterly direction, joining the Sudbury River to form the Concord

River in Concord. Tributaries to the Assabet include North Brook, Danforth Brook, Sunk Meadow Brook, Great Brook, and several unnamed streams.

In addition to the drainage systems, a number of important freshwater ponds are scattered throughout the town. These are small ponds, some of which have been created by damming of drainages, while others may be of natural origin. The largest ponds in the town are West Pond and Little Pond.

Vegetation. Plant life in Bolton is typical of New England upland locales in general. In areas not altered by urbanization and agriculture, woodlands are the most common habitats. A mixed oak-pine-beech forest is predominant, with numerous other species present in various other stages of forest growth. Almost all forested lands are secondary, consisting of white pine, red and black oak, beech, hemlock, white and gray birch, and red and sugar maples. Younger forests contain more birch and pine, occasional aspen, and fewer oaks and hemlocks. These shade-adapted species are more predominant in forests over thirty to forty years in age. Poorly drained locales, not as common in the uplands as in other sections of the Northeast, harbor more water-adapted species such as red maples, cedars, and numerous types of undergrowth.

Fauna. Bolton harbors a variety of habitat types, that in turn support a wide array of animal species that were important to the Native American communities, colonists and later inhabitants of Bolton. Woodlands are the most common habitat in the interior regions of New England, occupying much of Bolton. Wetlands are the second major habitat type present in the town.

Wetlands represent the most vital habitat for animal species in the interior regions. River otters (*Lutra canadensis*) and muskrats (*Ondatra zibethicus*) utilize interior waterways, and it is reported that beaver (*Castor canadensis*) were once found here, though not in the same numbers as in more dense hardwood forests. Alewives or freshwater herring (*Alosa pseudoharengus*), pickerel (genus *Esox*), and eels are present in ponds and streams, as are painted, musk, spotted, and box turtles (genus *Terrapene*). Numerous bird species wade and fish in interior wetlands, including bitterns (genus *Boaureus*), herons (family *Ardeidae*), egrets, ducks (genus *Anas*, *Aythya* and others), and osprey (*Pandion haliaetus*). Bullfrogs (genus *Rana*) and several toad species are present as well.

Woodlands provide the least diverse habitat in New England. However, many animals in the forest were among the most important for the area's Native inhabitants. The white-tailed deer (*Odocoileus virginianus*) is the only big game known to have frequented the Worcester plateau, although black bear (*Ursus americanus*) were hunted here for their furs. Porcupines (*Erethizon dorsatum*), fox (*Vulpes vulpes*, *Urocyon cinereoargenteus*), raccoons (*Procyon lotor*), squirrels (*Sciurus carolinensis*, *Tamiasciurus hunsonicus*), weasels (*Mustela* sp.) and three species of rabbit (*Sylvilagus floridanus*, *Sylvilagus transitionalis*, and *Lepus americanus*) were important food and clothing sources, as was the wolf (*Canis lupus*), which is no longer present. Recently, coyote (*Canis latrans*) have inhabited the region and are doing well. Woodland birds were used for food and their feathers, including the once common wild turkey (*Meleagris gallopavo*) and heath hen (*Tympanuchus cupido*), quail, owls, eagles, crows, and hawks (genus *Accipiter*, *Buteo*, *Falco*).

GENERAL METHODOLOGY

A central component of the Bolton project consisted of an archaeological reconnaissance survey. The purpose of this survey was to assess the condition of a sample of sites reported to exist in Bolton and to assess the prehistoric and historic potential of the town. The present study includes: 1) prehistoric and historic background research, and 2) a visual reconnaissance.

Background Research

In order to accomplish the background research, a variety of methods were employed. These included:

1. Research concerning historical documents, such as town, county, and state histories and maps, and state or federal records, to determine the location of reported Native American sites, and of historic structures and industrial sites within the area of investigation. The archaeological literature was researched to determine the characteristics of the types of sites that might be expected to occur within the project area. Sources consulted during background research are cited in the references section.
2. Researching archaeological site files maintained by the Massachusetts Historical Commission (MHC).
3. Researching archaeological site data and documentary records maintained by the University of Massachusetts at Amherst, and the records of the Bolton Historical Society and the Bolton Public Library.
4. Stratifying the project area using environmental factors known to be associated with Native American sites.
5. Conducting a preliminary on-site walkover@ visual inspection of selected sections of the project area, including those areas predicted to have high potential for containing prehistoric and historic archaeological sites.
6. Conducting interviews with local informants, amateur archaeologists, area historians, and other individuals knowledgeable in the history and prehistory of the area of investigation. Native American representatives of the Nipmuc Nation (Rae Gould) and Wampanoag tribe at Aquinnah (Mark Harding) were consulted.
7. Canvassing local residents as to the location of previously recorded historic and archaeological resources. This step was facilitated by a presentation to interested residents concerning the prehistory and history of the area, and discussing the scope of the project. The locations of several sites were reported during the presentation. Several local residents brought artifact collections for identification. Principal Investigator Mitchell Mulholland

identified material and plotted the location of sites on project maps. MHC site forms were then completed.

Criteria for Determining Archaeological Potential

Numerous environmental attributes were considered in order to predict which areas in Bolton possess high potential to contain archaeological sites. These environmental characteristics were identified by reviewing previous studies in areas with environments similar to that of the project area. The following is a list of the major criteria used during the investigation to assess the archaeological potential of the project area:

1. The presence of previously recorded prehistoric or historic sites.
2. Proximity to a National Register property.
3. Proximity to a supply of fresh water.
4. Proximity to seasonal or perennial subsistence resources.
5. Favorable soil characteristics (such as drainage, texture, and suitability for cultivation).
6. Topographic features such as slope, aspect, elevation, and barriers to prevailing winds (e.g., large boulders, and rock shelters).
7. Proximity to sources of raw materials (e.g., lithic and clay sources or quarries).
8. Proximity to topographic features conducive to industrial development, such as hydrologic locations.
9. Proximity to areas known to have been early historic settlement clusters, or having the potential to be early settlement areas.
10. Proximity to transportation routes.
11. Proximity to industrial, commercial, and agricultural markets.

The project area was stratified prior to field survey in order to eliminate those areas requiring no further survey and to delineate those possessing high potential to contain archaeological resources. Areas of obvious disturbance from residential development or highway construction were eliminated from the survey.

Predictive Model for Prehistoric Native American Sites

Documentary evidence of prehistoric sites rarely exists. Therefore, the likelihood for prehistoric sites to be present is predicted on the basis of an environmental model which uses geological, soil, and climatic data; previously recorded site locations in the southern New England region; and expected prehistoric site locational behavior.

Studies of foraging peoples in many parts of the world have shown that, at a general level, populations tend to adopt a least-effort strategy in the procurement of resources. The assumption is that they tend to choose the most energy-efficient means of procuring the maximum resource yield, without sacrificing group well-being (Jochim 1976). One of many ways to reduce energy expenditure is to minimize the distance between the place where a given resource is available and the locale where it is to be consumed. Consequently, one may predict that sites located with resource proximity in mind would be situated in those areas that are within the range of acceptability for human comfort and are also close to the resource being exploited.

The most important microclimatic factors adversely affecting human physical comfort in New England are excessive moisture and cold temperature. Dry, well-drained, and level areas with the warmest available exposure would, therefore, meet the major criteria in the aboriginal site selection process. One can predict that level areas with well-drained soils and level to slightly sloping areas with a southern exposure would contain the highest aboriginal site density. Well-drained, workable soils were also important site selection factors for both prehistoric and historic horticulturalists. Perhaps the most critical resource to be considered, regardless of site function, is water. In inland situations, sites are likely to be located near some source of fresh water, such as a spring, a lake, or a stream. Lakes and streams also provide access to fish, waterfowl, and other game.

In Bolton, most of the previously recorded sites are located on the Still River in the northwest section of the town. This is the largest stream and has an extensive floodplain. It is in this area that the highest density of prehistoric sites is predicted. Other locations have been previously recorded along the brooks.

In order to stratify the proposed project area effectively (thereby eliminating areas of low potential from consideration as a cost-effective measure), topographic maps compiled by the U.S. Geological Survey (USGS 1997) and soil data compiled by the Soil Conservation Service (Taylor and Hotz 1985) were used to delineate all areas with well-drained soils and minimal slope; no surficial geological map for the project area is available. Level, well-drained soils in close proximity to water sources were considered areas of high potential. Those located farther from a water source were considered to have lower potential. It is possible to stratify (rank) the town into zones of high, moderate, and low potential to contain archaeological properties, according to soil matrix and distance to water:

High Potential. Undisturbed areas less than 300 m (1,000 ft) from fresh water, on level, dry, well-drained soils are considered areas of high archaeological potential. Also, undisturbed areas located within 75 m (250 ft) of seacoasts on level, well-drained soils are considered high potential. Within this stratum, the zone within 75 m (250 ft) of modern or ancient watercourses have the highest potential.

Moderate Potential. Areas more than 300 m (1,000 ft) from water (modern or ancient), but on well-drained soil are considered to have low to moderate archaeological potential.

Low Potential. Areas that are poorly drained, in excess of 15 percent slope or that have been disturbed are considered to have low archaeological potential.

Maps of bedrock geology and historical documents were useful in locating old fall lines that have been eroded by stream action and are no longer active. In addition, USGS topographic maps were consulted to locate landforms (such as knolls or terraces) and identify points of high land in proximity to important resources. Topographic maps were also used to determine which slopes have the warmest exposure.

On the basis of the background research, the town was divided into survey units for the purpose of manageable discussion. Prehistoric and historic sites were plotted for the town and maps indicating the potential to contain prehistoric and historic sites were produced for planning purposes.

During the reconnaissance survey, evidence of recent historic disturbance of the landscape was used to eliminate areas from further attention wherever possible. The reconnaissance was also used to verify the evaluation of any area that previously had been assigned low probability on the basis of map or documentary research.

The predictive model is based upon assumptions about subsistence and settlement throughout southern New England, as well as archaeological site distributions found in areas with similar environmental characteristics. The predictive model is designed to be used by the Bolton Historical Commission to locate areas with high prehistoric site potential. The site sensitivity map provided by this survey also is based on the predictive model but can be changed by variations in the observed archaeological record. After collection of information on the reported prehistoric Native American sites in Bolton, the results were compared with the model and the map for accuracy. All of the reported prehistoric sites in the town fall within the category of Ahigh potential@ to contain sites. All of the ten sites are less than 300 m from a water source, are located on well-drained soils with slopes less than 8 percent. Half of the sites are located on the town=s largest water system (the Still River), but five sites are situated on brooks. Curiously, one of the sites located on a brook (the Schultz site) represents several thousand years of occupation, and is a considerable distance from the main stream. Given the low area of wetlands, lakes, and river, brooks were more attractive to Native people in Bolton than in other areas of Massachusetts.

Predictive Model for Historic Sites

An environmental model was not used in stratifying the project area for its potential to contain historic sites because considerable documentation exists concerning historic land use.

Field stratification for historic site location is based upon documentary research.

Identification of important time periods in an area=s history and recognition of places and people who were significant at the local, regional, or national scales, help to identify the kinds of archaeological resources expected during fieldwork.

Census records provide an indication of the patterns of population change, often reflecting periods of economic growth, decline, or stability. These patterns identify the time periods in an

area=s history in which significant events are likely to have occurred and to have left archaeological evidence.

Map research was very productive during the project. Maps produced since the eighteenth century provided the locations of public buildings, mills, houses, millponds, raw material sources, and in some cases lot lines. Since mapmaking methods have improved continuously over time and the level of detail on maps increased rapidly, this information must be used cautiously. Structures and land use before 1850 are seldom recorded clearly. Mapped structures often are not shown in their precise location, and shapes of ponds, roads and streams often are in schematic or general form. The increasing numbers of maps published after this date also tends to lead to an undue concentration on the later historic period. Maps are nonetheless indicative of the place of the project area in a transportation network and its relationship to places of active trade, manufacturing, or habitation.

The model for the historic period integrates the background material regarding the study area found in written history, historic maps, site repositories, and interviews with local residents. An assessment of the types of archaeological materials likely to be found in Bolton is made using this information. The historic period model is based much more heavily on local documentary resources than is the prehistoric model. It is much more specific than the prehistoric model because it is based on a larger set of shared assumptions about the timing and significance of events in the past.

Some of the factors considered in each case are:

1. The position of the project area in a transportation network;
2. The proximity of the project area to commercial, manufacturing, or resource production sites;
3. Periods of economic growth, stability, or decline measured primarily from the census; and
4. Unique or very local events which affect the use or reputation of the project area.

Field Methods

The reconnaissance survey was conducted by staff from Archaeological Services. Within each survey unit, a list of priorities was established based on the background research, particularly sites that were listed at the Massachusetts Historical Commission, and those revealed by local informants. During the field survey, a sample of sites was subjected to a walkover inspection. Statements are provided in this report about the condition of the sites and their potential to be eligible for inclusion in the National Register of Historic Places.

Information concerning soils, topography, historic maps, and prehistoric site distribution was used to assess which areas were most likely to contain sites, as described in the preceding section. A sample of these areas was subjected to a walkover in order to determine their potential to contain sites. The walkover included observations on sites, surrounding landforms, and development. Highest priority was given to visiting previously recorded archaeological sites to

assess their condition and potential future disturbances. The reconnaissance covered both prehistoric and historic sites. Based on the available time, the top priorities in each survey unit were then addressed. During the reconnaissance, photographs were taken of selected sites.

In the absence of evidence to the contrary, such as paving or ground disturbance, it is assumed that the house lots of all historic buildings in Bolton possess high potential for archaeological resources such as sheet middens of domestic refuse, stone-lined wells, privies, or buried foundations. Consequently, site numbers were generally not assigned to standing structures, although high potential should be assumed for these properties.

Survey during this project was not designed to include any subsurface testing. No archaeological testing was conducted anywhere within the town.

Massachusetts archaeological site forms for prehistoric and historic sites were completed to document the sites found during this survey. The forms have been computerized at Archaeological Services, and are on file in Amherst as well as at the MHC in Boston.

Public Presentations

On November 29, 2000, principal investigator Mitchell Mulholland made a public presentation to discuss the project. The presentation was given to a group of approximately 75 people in the Bolton Elementary School. In the published notices for the talk, local residents were asked to bring in collections of artifacts for identification and mapping. Five small collections were brought to the talk, and site forms were completed for new sites. This information was added to the site database. Several archaeological sites were reported by members of the public who attended the talk. A final presentation is planned for the fall.

Preparation of the Base Map

During this project, the USGS map of Bolton was used to record site locations and to create a base map for the cultural resources recorded in the town. The town was divided into seven survey units (Figure 3). The map was also used to summarize information concerning potential for archaeological sites. The base map provides a useful summary for planning and zoning purposes.

RESULTS OF BACKGROUND RESEARCH

Cultural History of the Bolton Area

The archaeological resources of Bolton are notably varied. They include ancient Native American encampments, but also colonial farms and nineteenth-century mills. Collectively, they represent a unique testament to the ingenuity, accomplishments, and land use practices of Bolton=s people over the last several thousand years. In this chapter, a series of narrative contexts summarize this cultural history, in order to enhance the interpretation of prehistoric and historic sites in the town.

Previous Archaeological Research in Central Massachusetts and Bolton

Interest in Native American sites probably existed throughout the early history of Worcester County, and is documented in town histories of the nineteenth century, such as Temple=s *History of North Brookfield, Massachusetts* (Temple 1887), and Emerson=s *History of the Town of Douglas, Massachusetts* (Emerson 1879). Although these sources described Native American sites and sometimes illustrated artifacts, the information they contain is limited, and usually of uncertain derivation (Johnson and Mahlstedt 1985:21).

The first archaeological excavations in Worcester County took place in the late nineteenth century. Little archaeology had been conducted in the United States previously, and professional standards of excavation and publication were not established, rendering most work of this early time of limited use to later archaeologists. Subsequent attempts to salvage information from this work had mixed success (as in Bullen 1940). More common was the work of amateur archaeologists and relic hunters, who assembled collections of Native American artifacts from fields locally known to contain sites. Most of these collections are also of little value, as the importance of maintaining provenience information was not often recognized.

During the early part of the twentieth century, the Massachusetts Archaeological Society was established, and with it the first systematic recording of sites (see Robbins 1949). In Worcester County, the Nipmuc Chapter was established by Elmer Ekblaw, Ripley Bullen, Karl Dodge, Laurence Gahan, and C.C. Ferguson (Ekblaw 1949). The chapter began organizing information, documenting excavations, and initiating more research in the region (Bullen 1940, 1948; Dodge 1965; Ferguson 1947). Unfortunately, even this work was often not fully documented, as most early reports were not particularly detailed (Johnson and Mahlstedt 1985:23). Research continued into the 1950s and 1960s, documenting a soapstone quarry in Millbury (Fowler 1966), a Paleoindian site in Mendon (Roop 1963), and large sites in the Brookfield area (Dodge 1965; Keith 1965).

The 1970s saw the beginning of cultural resource management archaeology, and a substantial increase in the amount of research. Most of this work consisted of small areas proposed for development, and the documentation of individual sites, but some exceptions focused on regional integration of information (as in Anthony 1978; Public Archaeology Laboratory 1978). This work continued into the 1980s and 1990s, increasing in frequency, but still consisting of small-scale areas of focus, and the occasional synthesis (as in Johnson and Mahlstedt 1985). Artifact

collections from the region have also been documented, identifying the types of resources expected from the local area (Johnson and Mahlstedt 1982, 1983).

Archaeological research within the town of Bolton can be seen primarily in the context of the cultural research management work of the 1980s and 1990s. As of 1999, eight archaeological projects had been reported that include sections of Bolton. Six of these projects were related to potential pipeline construction through multiple towns, three of which involved no subsurface testing (O=Steen 1987; O=Steen et al. 1988; O=Steen 1989). The other three pipeline projects did include actual excavation, one of which recorded the first Native American site recorded in Bolton (Jones et al. 1992), while the other two did not yield any new information from the town (Macomber et al. 1990a, 1990b). The other two projects consisted of a reconnaissance related to a soil conservation in multiple towns, which did not include excavation and found no sites in Bolton (Skinas 1995), and a survey related to the International Golf Club (Rainey and Mair 1999). The latter project identified two Native American sites in Bolton, and one in adjacent Lancaster. In addition, a historic site was recorded along Ballville Road.

Bolton is among the towns in Massachusetts that have seen recent archaeological work outside the context of cultural resource management projects. The Bolton Historical Commission has been active in recording numerous historic archaeological sites in the town, ranging from milldams and buildings, to locations of former historic buildings and cemeteries, to unique features such as a town pound, historic tomb, and industrial sites. In addition, the Bolton Conservation Trust and the Bolton Historical Society co-sponsored an archaeological project at the site of the seventeenth-century Whitcomb Garrison site. The project recovered seventeenth and eighteenth century domestic artifacts that provide evidence of the early history of the town of Bolton.

Native American Context of Southern New England

As is the case throughout the Northeast, evidence for **Paleoindian Period (13,000-10,000 B.P. [Before Present])** occupation in central Massachusetts is sparse. Material thought to be of this age has been recovered from the Chicopee drainage to the southwest of Bolton. This includes the Paleoindian hallmark artifact type, the fluted point, from unconfirmed sites along the Ware River and along the Nashua River in Lancaster (Anthony 1978; Johnson and Mahlstedt 1982, 1983), as well as the middle and east branches of the Swift River (Johnson and Mahlstedt 1985:26-28). The only Paleoindian material to have been recovered as the result of scientific excavations comes from the Mill River site (19-WR-110), located in Mendon in the southern part of the county (Roop 1963:23-24).

Evidence from the greater Northeast indicates that Paleoindians first settled in the area not long following the retreat of the Wisconsin glacier, which vacated New England by around 13,000 years ago. Recent calibration of radiocarbon dates based on ice cores, marine and lake varves, and sea coral indicate that the initial settlement of North America from Beringia is earlier than previously thought, clustering around 13,400-13,000 B.P. in the west, midwest, and southeast (Fiedel 1999). First settlement in the Northeast appears to be slightly later than in the western part of North America (Haynes et al. 1984), but certainly by 12,500 years ago. Claims for slightly earlier occupation of North America (as at the Meadowcroft Rockshelter in western

Pennsylvania [Adovasio et al. 1978, 1980]) to much earlier inhabitation (see Meltzer 1989; Lynch 1990) remains unconvincing to most archaeologists.

A tundra environment succeeded the Wisconsin glacier, and was, in turn, replaced by a spruce-parkland community (Davis and Jacobsen 1985; Gaudreau 1986; Jacobsen et al. 1987). Paleoindians living in these post-glacial ecological contexts have traditionally been characterized as hunters and gatherers who subsisted primarily on several large species of animals known to have herded in the Northeast, including the mastodon and mammoth. Little evidence of human interaction with these Amegafauna has been forthcoming, however, and more recent interpretations have focused on smaller species such as caribou and elk as primary food sources (Curran 1987; Curran and Dincauze 1977; Dincauze 1990; Dincauze and Curran 1984). This generalization may also have problems, emphasizing the reliance placed on these herding species when a wider range of resources was important to Paleoindian peoples.

No house features, burials, or ceremonial objects have been recovered from Paleoindian sites in the Northeast. This lack of data is the product of 10,000 years of organic decay, geological forces, and urban development impacting the archaeological record. All that remains of this time, in most cases, are stone tools. Projectile points with a distinctive basal flute can be identified as originating from this time, as this style occurs across North America in the Paleoindian era. Little else is ever found in addition to fluted points, making interpretation of Paleoindian lifeways difficult.

Based on ethnographic analogy, it is assumed that peoples of this time were seasonally nomadic, following the movement of game with the changing weather conditions of the year. Similarities in artifact forms among Paleoindians all across North America argue for a generalized character of adaptation, with few specializations to local conditions evident (Haynes 1980:119). A correlate of this fact is that population densities among Paleoindians were almost certainly very low. Raw materials utilized by these first inhabitants come from only a few sources, often from relatively distant locations (Spiess and Wilson 1989). This may indicate a high degree of mobility, established trade networks and/or a high frequency of interaction among units of population.

The time period following Paleoindian occupation, but predating the use of pottery and horticulture, has been designated the Archaic period by North American archaeologists. The **Early Archaic Period (10,000-8000 B.P.)** is thought to be a time of environmental change with a generally low population density. Because very few sites dating to this period have been discovered, little is known of Early Archaic lifeways. Harsh conditions and rapidly evolving environments may have contributed to both a scarce occupation of the area during this time period, as well as to the destruction of existing sites through landscape changes. Poor recognition of sites of this early date may also contribute to the lack of information on Early Archaic artifacts and lifeways. Evidence from the greater Northeast indicates that large hilltop sites were no longer as important as in the preceding period. In fact, sites are generally smaller, probably indicating that large bands were not utilized as social units. Large herds of game were apparently gone by this time, explaining the lesser importance of hilltop sites. As in the preceding period, tool types are uniform across the Northeast, but by this time the tools were being more frequently made of local materials (Braun and Braun 1994:29-31). It is likely that a smaller, localized population structure was developing.

There is, at present, no consensus as to how people of the Early Archaic period were related to those of the preceding Paleoindian period. Some researchers have argued that there is a "clear discontinuity" between Paleoindian and Early Archaic peoples, following some type of ecological over-exploitation (Ritchie 1969:16; Snow 1980:157-159). Others see important technological similarities that are interpreted as evidence of continued occupation by Paleoindian descendants during the Archaic period (Custer 1984). The present lack of data, whether due to environmental degradation, urban development, or simple scarcity of sites, prevents firm conclusions either way, despite arguments to that effect.

Bifurcate-base projectile points are the hallmark artifact of the Early Archaic period in southern New England. The distribution of bifurcate-base point surface finds indicates that people were present throughout New England at this time (Dincauze and Mulholland 1977). A bifurcate-base point was recovered at the Mill River site in Mendon, along with other materials assumed to be of this age (Roop 1963:22). The largest sample of Early Archaic materials in this region is located in the Chicopee drainage, where seven sites have been previously recorded (Johnson and Mahlstedt 1985:30). No information is available on sites of this time period from the Bolton area. However, at least sixteen bifurcate-base projectile points have been reported from sites along the lower Sudbury and upper Concord rivers (Ritchie et al. 1990). Important sites in the Northeast that form the basis of generalizations on the Early Archaic are the Titicut site in eastern Massachusetts (Robbins 1967), the Hollowell site on Staten Island, New York (Ritchie and Funk 1971), and the Weirs Beach site in New Hampshire (Bolian 1980).

During the **Middle Archaic Period (8000-6000 B.P.)** environmental conditions in the area began to approach those of today. The deciduous forest became established, providing a diverse array of plant and animal foods (Dincauze 1976; Dincauze and Mulholland 1977). Sites of this time period are more numerous than those of the Early Archaic, but still rare in comparison to subsequent stages. Again, one of the highest densities of previously recorded sites lies along the Chicopee drainage, though this, in all likelihood, represents the greater intensity of collecting in this area rather than the distribution of actual settlement. A large cluster of Middle Archaic sites is also known from the Concord drainage, to the east of the project area (Donta n.d.). Five sites of this time period are previously recorded from the Ware River system to the west of Bolton. Within the Nashua drainage, Middle Archaic sites have been recorded from Fort Devens in Lancaster, near a small upland pond in Leominster (19-WE-371), and on the Nashua in Ayer. Archaeological materials from southern New England provide evidence of significant local populations at this time, indicating a substantial degree of population growth had occurred by the end of this period (Mulholland 1984).

The variety of site locations occupied by people during the Middle Archaic period indicate that a multi-site settlement system had become established. Supporting evidence for this rests in a variety of tool assemblages and recovered faunal material (Dincauze and Mulholland 1977; Barber 1979). It is likely that this seasonal settlement system had begun during the preceding Early Archaic period (Ritchie 1984), though the scant evidence for this time hinders attaching any degree of certainty to this interpretation. Sites of this time are sometimes large, appear to be reused, and include sizable midden dumps, as at the Neville site in New Hampshire (Dincauze 1976). This indicates that the settlement system included permanent or semi-permanent base

camps to which social groups returned. Anadromous fish may have been an important resource, as is interpreted for the important Neville site in southeastern New Hampshire (Dincauze 1976).

The first evidence of religious beliefs becomes available at this time, though only from a few select sites. The most informative is L=Anse Amour, at the southeastern tip of Labrador. A Middle Archaic burial mound was excavated here, which included evidence of fire, the use of red ocher, and numerous grave goods (McGhee and Tuck 1975). This collection of materials may be interpreted as indicative of a belief in the afterlife.

There are presently three major projectile point styles that are recognized as diagnostic of the Middle Archaic period. These were defined by Dincauze on the basis of excavations at the Neville site (Dincauze 1976). They are: the Neville point, dating from approximately 8000-7000 B.P.; the Stark, from around 7700-7200 B.P.; and the Merrimack, from close to 7200 B.P. to the end of the period. In central Massachusetts, at least twenty-two sites have been recognized to contain these diagnostic types (Johnson and Mahlstedt 1985:31). Other artifacts used during this time include atlatls or throwing sticks, knives, perforators, axes, adzes, scrapers, abraders, ulus (semi-lunar ground stone knives), gouges, and harpoons.

Late Archaic Period (6000-3000 B.P.) sites in New England are much more numerous than in previous periods. Peoples of southern New England at this time occupied a wide variety of environmental settings (Mulholland 1984:277-280), and there appears to be a significant diversity in site type and function. Modern environmental conditions were present and the wild resources available were the same as those observed by the early European settlers and explorers. Population densities may have been sufficient to result in the development of multiple ethnic groups in the Northeast (Dincauze 1974). Three cultural traditions have been identified based on artifactual materials: the Laurentian, Susquehanna, and Small-Stemmed, all of which are present in the central part of the state, although Small-Stemmed materials may be the most common in this area. Along with the development of multiple traditions, increased specialization and the exploitation of a broad spectrum of resources are interpreted for this time period.

Late Archaic sites are numerous in Worcester County. Nearly half of these sites are located along the Chicopee drainage, with a substantial number also from along the Ware River. However, fewer sites are previously recorded from the northern part of the state (Johnson and Mahlstedt 1985:33-39). In Bolton, Small-Stemmed artifacts were recovered from sites identified by Dale Farrell along the Still River. Other Late Archaic sites tested in the vicinity are previously recorded from Pepperell, Shirley, Westborough, and Lincoln. The Charlestown Meadows site in Westborough yielded Jacks Reef and Vosburg projectile points, in addition to a radiocarbon date of 5100 \pm 250 years (Hoffman 1990; Donta and Mulholland 1994). The Oak Knoll site in Lincoln was the site of a butchering station approximately 2,850 years ago, where Orient Fishtail bifaces were re-sharpened and used as knives around a hearth (Donta 2001).

The relationship between the three recognized Late Archaic traditions remains unclear, after decades of debate (Ritchie 1971; Dincauze 1974, 1975). Laurentian materials are more numerous in the central and western parts of the state, raising the possibility that this tradition represents an interior, upland adaptation. An alternative interpretation is that the Laurentian, part of the greater Lake Forest tradition which has a distribution that extends from New Brunswick to Wisconsin, represents some form of ethnic identity. Laurentian materials appearing approximately 4,500

years ago may be indications of some form of population movement, probably originating from the Great Lakes region.

The significance of the more common Susquehanna and Small-Stemmed traditions is not previously recorded. Dincauze has suggested that the two represent different populations, with the former consisting of an intrusive group, which peacefully coexisted with the latter people for some thousands of years (Dincauze 1974, 1975). Alternative explanations include the possibility that these traditions are somehow different in function, representing different types of tool kits. At present, there is some agreement that the technological precedents for Susquehanna tools are found in the southeastern United States, ultimately deriving from Middle Archaic stemmed biface types in this region. Small-Stemmed, or Narrow-Point tradition artifacts, are widely viewed as a pan-Northeastern phenomenon, probably deriving from the indigenous people of the northeastern Middle Archaic. It is likely that the presence of Small-Stemmed and Susquehanna artifacts in a single site represents some combination of technological exchange and population mixture, varying depending on the location (Ritchie 1969; Dincauze 1976; Snow 1980; Custer 1984; Bourque 1995).

Late Archaic sites are more common in central Massachusetts than in previous periods. In fact, throughout southern New England, sites dating from the fifth and fourth millennia (5000-3000 B.P.) are the greatest in number of any time period (Mulholland 1984). However, the large representation for this time period may be somewhat overstated, due to the over-reliance on certain projectile point styles as temporal markers of the Late Archaic. Small-Stemmed points are the most common artifact styles of this era, and they have traditionally been utilized as a diagnostic for the Late Archaic. However, closer examination of radiocarbon dates associated with this point style show a wider range, extending well past the 3000 B.P. end date for this period. It is likely that a substantial number of sites currently attributed to the Late Archaic actually postdate this period (Filios 1990).

It is thought that people of the Late Archaic period in southern New England developed a more locally focused subsistence economy than during previous times. This may be due to increasing population levels, requiring groups to remain in more confined territories to avoid encroaching on others. Some degree of sedentism is interpreted by at least the end of the period, based on changes in subsistence strategy. Shell middens begin to appear in some coastal locations, indicating increased use of shoreline resources (Bourque 1976). Extensive fish weirs have also been documented for this time, where large numbers of fish could be speared in an organized manner (Johnson 1949). Some limited experimenting with cultigens also occurred, the idea probably spreading from the southeastern and central part of the continent. Squash, gourds, and sunflowers grew wild in parts of the northeast, and a few Late Archaic people began to purposefully plant these species to supplement their diets.

There is also more information on the ceremonial life of Late Archaic times. Burial sites are much more commonly encountered in excavations, providing a glimpse at the religious beliefs of the era. The Red Paint People of Northern New England and the Canadian Maritimes are one example. These people used large quantities of red ocher and included decorated tools and ornaments in the burials of some of their dead (Sanger 1973; Tuck 1976). Another burial site of note is the Wapanucket site in southeastern Massachusetts (Robbins 1980), which also included tools and red ocher. Cremation burials of the Susquehanna tradition are present across New England, featuring stone and bone artifacts and faunal remains (Dincauze 1968).

The third major era of prehistoric times is called the Woodland period. This period was originally defined to include a broad area of the Northeast, encompassing new technologies such as ceramics, the bow and arrow, and horticulture involving exotics such as corn. As with the Archaic period, archaeologists have divided the Woodland into three stages, used to demarcate changes in adaptation.

The **Early Woodland Period (3000-2000 B.P.)** has generally been considered a period of population decline following a cultural florescence during the Late Archaic. Site numbers are lower, and site locations are more frequently restricted to coastal lowlands and river valleys. These characterizations, however, are based on the traditional association of several widespread forms of projectile points with only the Late Archaic period. Recent research indicates that Small-Stemmed and Susquehanna point styles are found to frequently postdate the 3000 B.P. end date for the Late Archaic (Funk and Pfeiffer 1988; Filios 1989). The likely interpretation to be gleaned from this information is that the Early Woodland is merely under-represented in the existing corpus of site files, rather than in actual number of sites. Should a method of correcting this bias be established, it is probable that the Early Woodland would have to be re-characterized as continuing some trends of the Late Archaic, such as population increase, while new technologies became a part of life.

Some changes in subsistence strategy are apparent during this time, probably representing a continuation of the Late Archaic trend toward a more localized, semi-sedentary settlement system. The more permanent types of camps were established along the coast or inland watercourses, where waterfowl, fish, and sea mammals could be easily exploited. Shellfish were also taken, although it seems that these were not a major dietary component until the Middle Woodland. Despite an increasingly localized focus of subsistence, the pattern remained one of hunting and gathering, particularly along water bodies where fish could be included in the daily fare. Technological changes are an important component of how archaeologists understand the Early Woodland period. This millennium witnessed the first widespread use of ceramics across the Northeast. Traditionally, ceramics were thought to coincide with the appearance of horticultural practices, serving as a convenient means of storing the surplus foods obtained through purposeful planting. It is now known that in most of New England, cultigens were not an important part of the subsistence routine for at least 1,500 years after ceramics became established in the area.

The rich burial ceremonialism of the Late Archaic continued into the Early Woodland, with exotic artifacts such as gorgets, birdstones, pottery pipes, copper beads, and red ocher placed in graves with human remains (Ritchie 1965; Ritchie and Funk 1973; Spence and Fox 1986). The significance of these religious practices is not known, but they do not appear to reflect any kind of hierarchical social relationships. The presence of exotic goods in sites provides evidence of established trade routes that extend to the Midwestern section of the continent, where the Adena complex was well established.

Much remains to be understood about this time period. Hindered by confusion with the Late Archaic period, sites of the Early Woodland often go unrecognized, or are misinterpreted. Early and Middle Woodland materials, as is the case throughout much of southern New England, are not especially abundant in the local area. One of the most important Early Woodland sites is an

Adena-related cemetery, located in the Chicopee drainage (Keith 1965). Other sites of this time are reported from West Boylston, Harvard, and numerous sites along the Assabet and Sudbury drainages in Middlesex County. In contrast to the relative scarcity of Early Woodland sites, Late Woodland sites are more numerous throughout most of Worcester County (Johnson and Mahlstedt 1985:40-44).

The **Middle Woodland Period (2000-1000 B.P.)** witnessed a continuation of trends of the Early Woodland. Again, however, technological innovations provide evidence of change. This part of the Woodland period is differentiated from the preceding millennium by a change from simply decorated ceramics to widespread use of more elaborately decorated wares. No functional interpretation for this change appears accepted; rather, the increased decoration probably has to do more with style and ethnic identification, a traditional archaeological interpretation. Another new technology became important: the bow and arrow is thought to have become a part of regional technology at this time.

Subsistence trends of the Early Woodland continued. Large semi-permanent, or perhaps even year-round, settlements were utilized by this time (see McManamon 1984). These locations were supported by specialized subsistence foci, such as shellfish, fish, and sea mammals. The first large shell middens appear in the archaeological record at this time. The presence of shell middens may be related to the establishment of mature shellfish beds following the post-glacial stabilization in sea levels. Continued experimentation with horticulture using local cultigens is inferred for this time, though evidence for such activity is rarely preserved.

The frequently elaborate burial ceremonialism of the Late Archaic and Early Woodland periods was rarely seen during this millennium. The reasons for this are not clear. Contact between neighboring areas of the region are thought to have been important, as exotic lithic materials were still frequently used throughout most of the Northeast.

The **Late Woodland Period (1000-450 B.P.)** represents the end of the prehistoric era. It is during this and the preceding period that the pattern of settlement witnessed by the first European explorers became established. Also during this time, horticulture, including exotic domesticates such as corn and beans, became a widespread and occasionally important dietary element. There is more evidence of permanent settlements, or at least locations that were used for much of the year, especially on the coasts (Carlson 1986; Yesner 1988). It has traditionally been assumed, in part due to the early historic descriptions, that permanent settlement became widespread as a result of a dependence on corn. However, corn is infrequently found at sites in New England, despite all efforts to recover evidence for its use (Bumstead 1980; Thomas 1991). A more likely interpretation for the trend toward more permanent settlements is an increase in population, territoriality, and conflict. Regardless of the role of domesticated plants in the overall diet, wild plants and animals were still very important in daily subsistence (Mulholland 1988).

In many parts of the Northeast, subsistence and settlement were still based on a hunting/gathering/fishing system with seasonally based camps. Deer, rabbit, birds, and sea mammals were hunted, while fish and shellfish were taken, and a wide variety of plants and vegetables were collected. The growing population levels may have in part prompted some to turn to horticulture to relieve a decreasing degree of flexibility in food sources. Other mechanisms adopted included using more marginal areas and expanding the variety of foods to

include what had previously been considered less desirable resources (Luedtke 1980; Lightfoot 1985).

Less is known about Late Woodland religious beliefs than in the earlier phases of this period. While burials are still found from this time, the ceremonialism attached to human remains seems to have waned by about 1,000 years ago. Burials are often unadorned, and sometimes include many individuals. Grave goods are not commonly found, but sometimes do occur in small numbers. Why the decrease in burial ceremonialism occurred is not fully understood.

During the Late Woodland period, the ethnic identities encountered by European explorers came into full form. In New York State, the Iroquois and Mohawks established their territories and core areas of settlement, including some permanent villages. In southern New England, the Pawtuckets, Nipmucs, Massachusetts, Wampanoags, Pequots, Nehantics, Mohicans, and other groups came into form, with each group developing relationships with particular geographic areas. Most of these ethnic groups or nations were composed of smaller tribal entities that were based around a permanent meeting place or village. Trade routes and patterns of conflict between these groups also became established.

The end of the prehistoric era is designated as the arrival of Europeans in the Northeast, who recorded the first written or historic records. The end of the Woodland period is thus somewhat varied, depending upon the exact area considered. European contacts with the area began at the very end of the fifteenth century, with Italian, Portuguese, and French explorers reaching coastal locations by the year 1500. In some cases, interior areas of New England were not contacted directly for many years following this date.

Archaeological Implications. Numerous undisturbed Native American sites are predicted to exist in Bolton, from all periods of occupation beginning some 10,000 years ago to the historic period. While there are only nine sites on record at the MHC (two of which were identified in this survey), the low number is more a product of the low frequency of archaeological surveys in Bolton, rather than reflecting low Native American populations. The largest sites are predicted to be located in the northwestern part of town where the Still River and its wide floodplain are located. Of all the environmental characteristics conducive to Native site location, well-drained, level ground, in proximity to a large stream or other large water body, rank the highest. It is in these riverine areas that adjacent dry ground is available on which to erect shelters; soils are replenished periodically making them suitable for horticulture (in recent years); a freshwater source (and transportation corridor) is at hand; aquatic and many animal species attracted by the water source are available; and cattails and other economically important aquatic vegetation species are abundant.

Interestingly, the sites that are on record in Bolton reflect occupation during the Late Archaic period (5,000 to 3,000 years ago). Following the Late Archaic, there is an apparent gap in occupation until the Late Woodland period approximately 400-1,000 years ago. This does not mean that sites earlier than 5,000, or between 3,000 and 1,000, are not located in Bolton, only that the numbers may have been lower than the Late Archaic and Late Woodland period.

The period from 5,000 to 3,000 was a time when Native people spread throughout the interior of southern New England occupying diverse environments (Dincauze 1974, 1990). While the main streams and lakes were still occupied by larger sites during this time, small sites were established near every conceivable water and raw material source, especially wetlands. Paleo-

environmental studies suggest that conditions for available food improved during this time. Anadromous fish (shad and possibly salmon) were available on many of the main streams. Pollen analysis from cores across southern New England show that interior Massachusetts had a relatively low percentage of oak trees until approximately 4,500 years ago (Mulholland 1984; Bernabo and Webb 1977). The forests of 4,500 years ago experienced an early floral catastrophe that led to the decline of much of the hemlock population in New England. The cause for the decline is still unknown but is believed to have been an as yet unidentified pathogen (Webb 1982:570). The resulting loss of this economically barren species was a resurgence of oak trees, whose plentiful acorns provided abundant food for humans as well as supporting important animal species such as the Virginia Deer. The gradual increase in oak trees continued through European Contact period. Thus, it is not surprising that the archaeological record for Bolton is dominated with sites from the Late Archaic.

While oak and other nutritionally important species such as hickory and chestnut remained in abundance through the Late Woodland period, climate was cooler in the Bolton area than in western and southern communities. The number of frost-free days in the area averages in the 120-day range (Mulholland 1993), far lower than in the east and south. This would have had a negative effect on horticulture. Horticulture had become established in the region at around 1,000 years ago (the Late Woodland period) and is attributed by some to be the cause for a rise in Native population. Some Bolton sites date to the Late Woodland period, but they are fewer than those of the Late Archaic.

The observed gap between 3,000 and 1,000 years ago roughly follows a regional trend in which sites slightly increased in the coastal zone and declined in the interior (Mulholland 1984 and others). This may reflect a slight climatic decline at this time which would have affected the growing seasons of many plant species.

Note: Site location information is provided here in the original report. Site locations are confidential to avoid vandalism and looting.

Native American sites usually are buried below the surface. Sites may become visible if erosion or other disturbance has taken place. Typical eroded or otherwise disturbed sites may be characterized by broken pieces of fire-reddened rock used in cooking; tiny sharp Aflakes@ of quartz, quartzite, rhyolite and chert; charcoal and burned bone, and less often projectile points (Arrowheads@) and brown muddy ceramic sherds (Table 2). Eroded sites should be brought to the attention of the Historical Commission, site forms completed, and plans made to stabilize the site. Artifact collection and vandalism should be discouraged.

The Bolton area contains sites that could shed light on the occupation of the New England interior. This is a topic that has been studied before, but by no means intensively. In the future, many archaeological surveys will take place in Bolton as development spreads through the town. In these and other surveys, research questions that could be addressed include: Why are sites for the periods of 10,000 to 5,000 and 3,000 to 1,000 underrepresented in Bolton? Is this a real pattern or is it related to survey bias? Do the abutting towns have the same pattern of occupation through time? What was the importance, if any, of anadromous fish to Native Populations in Bolton? What was the attraction of Native people to the repeatedly occupied Schultz site which was located well away from the main stream? Are there other large, long-term occupation sites in town in similar interior locations? What was the use of wetland plant species by Native people through time? Do Bolton=s wetland borders contain small Native sites? On the floodplain of the

meandering Still River, does the regional pattern of old sites on the highest ground and recent sites nearest the water exist? What are the sources of rhyolites and other lithic raw materials? Is there evidence of European Contact period sites in town?

Native Occupants in Bolton During the Contact Period (1550-1620 A.D.)

At the time of the first European arrival in the area, southern New England was occupied by Eastern Algonquian tribes (Salwen 1978). All Algonquians spoke related languages, which differed from the Iroquoian languages prevalent in New York State and southern Canada. Central Massachusetts, and present-day Worcester County, was occupied by the Nipmucs, an Algonquian subgroup. The Nipmucs were closely related to the Algonquian speakers of the Connecticut River Valley in western Massachusetts, called the Pocumtucks. Both groups were regarded as the Loup (Wolf) by the French, and spoke dialects of a language designated as Loup A (Goddard 1978). The Nipmuc also shared close ties with the Massachusetts speakers of the eastern part of the state, including the Pawtuckets, Massachusetts, and Wampanoags. To the south of the Nipmucs were the Narragansetts and Pequots. Social divisions between the groups was more fluid than is often represented in the division of New England Natives into formal Atribes@.

The Nipmucs were composed of a number of subgroups who spoke a mutually intelligible language, although possibly with some dialectical differences. The boundaries of the subgroups appear to have been indefinite or fluid (see Johnson 1993), but were probably based on natural geographical boundaries (Connole 1976). One of these subgroups, the Nashaways, occupied the Nashua River valley, including Bolton and Lancaster. Other Nipmuc subgroups were the Quabogs of Brookfield, Quinsigamonds of Worcester, and Waushacums of Sterling (Gahan 1941).

Nipmuc subgroups were composed of political units called Asachemships@ by historic sources. This comes from the word sachem, which was a standardization of the various dialectical versions (sontim, sachim, saunchem, sagamore) of the Proto-Algonquian sakimawa, meaning chief (Goddard and Bragdon 1988:2). The sachemship consisted of the sachem and his family; the chief men, who formed a council, and their high-ranking families; common people; and others (Bragdon 1996:140-143; Johnson 1993). The sachem was usually male, and a member of a privileged family or lineage. Early sources indicate that social status was inherited, and the position of sachem was passed down along male lines, although not necessarily directly from father to son (Simmons and Aubin 1975:24). Legitimacy is a useful concept in understanding leadership, and was comprised of a combination of genealogy and action, both being used to bolster power (Johnson 1993). Chief men and their families also inherited their positions, which required them to advise the sachem, who in turn needed their consent to make his wishes binding (Goddard and Bragdon 1988:3). Common people also inherited their membership in the sachemship, naturally owing allegiance to their respective leaders, who represented their land and their ancestors, and who would make decisions affecting their descendants. The consent of the people was needed by the council and sachem regarding important matters such as warfare and matters of the land (Simmons 1986:13). In addition, there are some elements of Nipmuc society that are not clearly understood. Slaves and servants were reportedly a part of the culture, but little is known about these people (Mayhew 1694:9; Williams 1936:5). Some specialized roles have

also been identified, such as military leaders (Trumbull 1903:67) and tribute collectors (Winslow 1910[1624]:55, 57).

Sachemships were associated with specific geographic locations, known to all area sachems and their followers. The fluid nature of Nipmuc territory and political leadership, undoubtedly exacerbated by the radical changes impacting Native communities in the seventeenth century, is the main source of confusion in the historic descriptions of Native society and territories. Further, the fact that none of the Native political units conformed to the European concepts of bounded village lands made them difficult for early European observers to comprehend (Johnson 1993).

The Nipmucs were semi-sedentary horticulturalists who relied on cultigens such as corn, beans, and squash that were grown on the flood plains of rivers such as the Nashua, as well as wild plants and game. Families lived in circular houses known as wigwams, constructed with poles bound inward and covered with bark or mats. People slept on platforms or on mats, blankets, or furs on the ground, next to the fire. Early historic reports indicate that the people moved seasonally to areas known to have resources available at those times of year, such as wetlands, rivers, forests, and fields.

Trade was well established along ancient routes, in manufactured goods such as steatite vessels and pipes, wooden bowls and spoons, clothing, and raw materials like shell and copper (Bragdon 1996:80-98). Trade was one important component of alliances, which served to defend territory and establish and legitimize authority (Johnson 1993).

Native groups in the area were already experiencing dramatic changes in their traditional ways of life by the seventeenth century, or even in the late sixteenth century. Epidemics of smallpox and other diseases in many parts of New England in 1615-1619 and possibly earlier reduced local population sizes by 90 percent (Spiess and Spiess 1987; Carlson et al. 1992), altering traditional practices and social life. It is estimated that, prior to the influx of European diseases, the total Nipmuc population probably numbered in several thousands. No pre-Contact estimates are available, and as it is not clear whether other tribal groups were included among those later defined by colonists as Nipmucs.

Native Occupants in Bolton During the Historic Period (after 1620 A.D.)

Much remains to be learned about the Native American inhabitants of Bolton prior to the arrival of colonial settlers in the late seventeenth century. It is known that Native settlements were present in Lancaster along the Nashua River (Nashaway), and in the southern part of Sterling (Waushacum). However, as the town is located in close proximity to two known Native villages, Bolton was undoubtedly important for transportation, and probably also for seasonal sites, such as fishing and hunting camps.

At least two major ancient trails passed through the town of Bolton. The Old Bay Path and North Bay Path led from the Nashaway village in Lancaster to the east, through Bolton. The North Bay Path follows what is now Route 117, into Stow, through Concord, and east to Massachusetts Bay. The Old Bay Path runs southeast through the town, along Old Bay, Farm, Bolton, and Spectacle Hill Roads into what is now Hudson and east through Sudbury (Whitcomb 1988:37).

Some early historic reports indicate that the Nipmucs of the southern Worcester plateau were tributary to the Pequots, and possibly also the Narragansetts (Gookin 1972; see also Salisbury

1974). This entailed paying periodic tribute in the form of wampum or goods, in exchange for maintaining some form of truce. Following the Pequot War of 1637, this tributary relationship collapsed, and the existing traditional relationships became less predictable. The Nipmucs then faced new challenges as the pace of European settlement greatly increased west from the initial settlements at Plymouth and Massachusetts Bay.

By the time of first European settlement, the Native American population, and the number and size of Native settlements had already dropped significantly. In 1642, a trader from Watertown by the name of Thomas King purchased an eight by ten mile tract of land from the Nashaway sachem Sholan. Like most other sachems in New England, Sholan completed a transaction that he believed offered the new settlers use of the land, but not permanent rights that would affect Nipmucs' hunting grounds. King erected a trading post that proved prosperous and attracted Native traders throughout central Massachusetts (Marvin 1879). European settlement of the area was delayed by the difficulty in crossing the large Sudbury River, but by the early 1650s an agricultural village had formed consisting of some twenty English families. The Nashaway plantation was officially incorporated in 1653.

The Nipmucs were divided into pro-war and anti-war parties when King Philip's War erupted in 1675. The insurgency was led by the Wampanoags' sachem Metacom, also known as King Philip (Leach 1958). The pro-war faction dominated in the Nashua Valley, in the area of the colonial settlements of Lancaster and Groton, and led by the sachem of Nashaways, Shoshonin. Under the leadership of Shoshonin, also known as Sagamore Sam, the Nashaway band of Nipmucs joined the fighting in King Philip's War during the summer of 1675, leading attacks on the English settlements at Lancaster, Medfield, and Northfield. Other Nipmuc sachems were also important in the war, including Muttawmp, who was a leader in the Native victories at New Braintree, Brookfield, Bloody Brook, and Sudbury; Monoco, who was involved in Lancaster and Northfield, and led the attack on Groton; and Matoonas of Pachacoog (Schultz and Tougias 1999:44).

In February 1676, the English settlement at Lancaster was burned. Many inhabitants were killed, and others were taken hostage, including Mary Rowlandson, whose narrative of the experience became widely known. Groton was attacked in March of 1676, with similar results. During the war, the few Nipmucs who were considered neutral were rounded up and sent to a plantation of confinement at Nashoba. Using the Nipmuc country as a base, Metacom launched a series of raids throughout New England that continued until he was finally captured and killed in August of 1676.

Following the death of Metacom, organized Native resistance against the English ended. However, the English continued hostilities against all Native peoples, hunting down and executing any Nipmucs they felt had collaborated with Metacom. Other Nipmucs were sold as slaves, while a few managed to escape, and joined other Native peoples at settlements in St. Francois, Quebec, Mohican villages on the Hudson and Housatonic, and Munsee villages in northern New Jersey (Grumet 1995:104).

During King Philip's War, the Native population of New England, already heavily impacted by disease and prior conflicts, was further reduced. It is estimated that 3,000 Native Americans died during the conflict, perhaps as much as 15 percent of the population (Schultz and Tougias 1999:5). Many hundreds of others were also captured and sold as slaves in the West Indies. After the war, most of the remaining Native peoples were gathered and placed on small reservations, or

were collected into a number of *Praying Towns* supervised by Puritan missionaries (Cogley 1999). Confined to mixed communities after 1680, many traditions and tribal identities of New England Native peoples disappeared within a few decades. Even the small amount of land allotted for Native settlements was further eroded by European encroachment over the succeeding generations. The Hassanamesit Reservation contained 8,000 acres in 1728 when the Commonwealth of Massachusetts purchased the land. A small number of Nipmucs continued to live in the region, with communities in the eighteenth century in Worcester, Webster, Grafton, and Uxbridge and in smaller numbers throughout many other towns of Worcester, Middlesex, and Norfolk counties, and in Connecticut.

Almost 250 years after the Pilgrims had landed at Plymouth, the Massachusetts legislature in 1869 finally passed a law granting citizenship to the Nipmuc. The Chaubunagungamaug band of Nipmuc currently have 4 acres of land in Webster, Massachusetts, and the Hassanamisco band in Massachusetts have 4 acres of land in Grafton. Recent applications for federal recognition list 1,640 members for the Hassanamisco Band, and 335 members for the Chaubunagungamaug.

Archaeological Implications. Archaeological sites representing the historic period of Native occupation are extremely rare throughout the region. The period covers only approximately 200 years, a fraction of time in prehistory. The Contact period was a period of turmoil with mobile groups passing through the area, either participating in warfare or fleeing from it. It is also a time when Natives were adopting new European material culture. There is no question that some sites containing Levanna stone tools and Native pottery may date to the historic period. Some sites of the period may contain artifacts representing both the Native and European cultures. To date, no Contact period or later Historic period sites are on record, but this may change as surveys are conducted in the future. There is mention of Native presence in historic times. The area east of Bolton Center and east of Long Hill has been called Wigwam Brook historically (Whitcomb 1988). Contact period sites are likely to contain stone tool styles such as Levanna and Jack=s Reef; brass and iron Arrowheads made from traded sheet metal or kettles; occasionally Arrowheads made from European flint carried as ballast in ships; brown, crumbly Native pottery; European-like red wares, brass spoons, Italian glass beads, iron axes, iron hoes and other tools, etc. (Table 3). Historic period Native Americans often lived in small wooden houses modelled after the European style, but often a part of the year was spent in wigwam-like structures in the traditional resource gathering locations. Thus, distinguishing between pre-Contact and Historic period sites can, at times, be difficult. Native burial grounds may be unmarked and thus vulnerable to development. In some communities, historic Native cemeteries are marked with un-engraved field stones, and occasionally one or two engraved stones.

In neighboring Lancaster and Sterling and nearby Grafton, there were areas set aside for Native American settlement. For a short time these areas may have been occupied by most Natives living in the area following King Philip=s War. It is probably that the existence of these areas drastically reduced the Native population from Bolton and the surrounding communities. The dearth of Native people in Bolton was evident in the census of 1760 in which an Indian residents were counted. None were residing in Bolton.

In future archaeological surveys Contact period sites may be identified. Research Questions that could be addressed include the following: Are Historic-period Native sites underrepresented in Bolton in comparison to other upland communities? Is there evidence of historic period Native

people occupying the Still River area? Are there Contact period sites in the other towns bordering the Still River? Do Native people resettle Bolton after King Philip's War? Does the assimilation of European tools among Native Americans parallel that observed in other communities? Is there evidence of the persistence of Native tool making techniques into the historic period?

European-American Settlement Contexts

As historical and archaeological information was gathered during the present community-wide reconnaissance, Archaeological Services assigned *temporary archaeological site numbers* to known and inferred site locations in chronological order of their recording. In some cases, sites had previously been reported to the MHC. In the following text, the names of archaeological sites are followed by site numbers assigned by the MHC. These numbers correspond to the survey unit maps (Bolton Historical Commission files) and tables included in this report. Many of the historic archaeological sites are derived from historic maps. These maps include Holman and Longley (1794), Holman (1831), Walling (1857), Beers (1870), Richards (1898), and USGS quadrangle maps beginning in 1898 (Figures 6-13).

Government and Demography in Bolton (Public Sites)

The Town of Bolton was originally part of Lancaster and the Nashaway Plantation, established on the western frontier of the Massachusetts Bay Colony in 1642. Bolton was the southeastern extremity of a tract of land, measuring eight by ten miles, purchased by Thomas King of Watertown from the sachem Solan of the Nashaway Nipmucs in 1643 (Whitney 1793). Sections of Old Lancaster were later sectioned off and became parts of the towns of Harvard (1732), Bolton (1738), Leominster (1740), Berlin (1784), Sterling (1781), Boylston (1786), and Clinton (1850). Thus, Lancaster and Bolton share a common history prior to the mid-eighteenth century.

Bolton derived many benefits from the establishment of its town center on the Great Road, which was the primary east-west thoroughfare in the region. The first meetinghouse, common, and residential cluster were accompanied by nearby grist and sawmills and farmland on Great Brook. In the colonial period, the town center featured several commercial concerns, provided lodging to stagecoach passengers, and was linked to the regional core areas of Lancaster and Worcester (Steinitz et al. 1985). During the nineteenth century, the development of Bolton Center and other center villages in the region was both the material manifestation of contemporary economic experience and an elaboration of an existing settlement system (Wood and Steinitz 1997).

The archaeological resources in Bolton related to the civic history of the town include the locations of meetinghouses, churches, schoolhouses, and cemeteries. Bolton's first town burial ground, the Old South Cemetery (MHC 800), was established about a half-mile south of the town center in 1739. The Old Fry Cemetery (MHC 805), a Quaker cemetery located in Fryville, was established during the Colonial period, possibly as early as 1750. By 1820, the Old South Cemetery had reached its capacity so two new town cemeteries were established in 1822. The West Cemetery (MHC 802) was established about a mile and a half northwest of the town center and is located on what is today Green Road. The Pan Cemetery (MHC 801) was established

about a mile and a half east of the town center and is located on what is today Main Street. In 1844, a new Quaker Cemetery (MHC 803) was established about a quarter of a mile north of the Second Quaker Meetinghouse on what is today Berlin Road. A smallpox cemetery (MHC 804), located off Sugar Road, contains two burials from 1845.

Government and Demography in the Plantation Period (1620-1675). Colonial settlement of the Lancaster area (which originally included Bolton) commenced in 1643, and the municipality known as Lancaster was delineated in 1653 and 1654 (Worcester County 1879). Apparently, Thomas King and a few others bought the land as an investment, hoping to find iron ore deposits. Disappointed, King sold his trading house, shortly before 1647. In 1653, there were nine colonial families in Lancaster, and their petition for the incorporation was granted in May of that year (Marvin 1879).

There were two primary areas of residential settlement in Old Lancaster during this period. One was on The Neck, while the other was located between George Hill and the South Branch of the Nashua River. The first meetinghouse and burying ground were located between the residential areas at the point where two river branches converge (Marvin 1879). Farming was the dominant economic activity in early Lancaster, and continued to be central for many years. The territory was attractive to settlers because the land was fertile, not too rocky, and not too densely covered with forests (Worcester County 1879). The first Lancaster meetinghouse was built in 1658, on the highest point of the middle cemetery where it was visible to all residents of the town.

In the Bolton area, isolated farmsteads were established on the east side of Wataquodock Hill (by 1665) and on the west side of Long Hill (by 1670). The threat of Indian attack generally discouraged settlement outside of established villages. By 1675, there were approximately 350 residents in Old Lancaster (Worcester County 1879). Only a small number lived in the Bolton area.

Even as the Massachusetts Bay Colony was becoming firmly established by the mid-seventeenth century, profound changes were underway among the Native American populations of southern New England. While social and territorial boundaries between Indian groups had traditionally been flexible, with considerable interaction occurring between tribes, a correlation between territorial boundaries and Indian ethnic groups became evident as early as the 1630s. When the fur trade with Europeans became integral to the Native economy, this pattern was hardened, and competition between tribes apparently intensified. Wampum, a traditional unit of exchange, was used as a form of hard currency by the tribes, as they adapted to the European economic system. Desire for control over trapping grounds and access to trade with Europeans led tribes to expand jurisdictions over headwater areas. By the 1670s, however, the fur trade was in decline, and tribal populations had been greatly reduced by disease and warfare. Increasingly, Native land rights were traded for money, goods or political security (McBride and Soulsby 1989). In certain areas, Indians were angered by the trampling of their crops by English livestock, and by the uncontrolled expansion of English settlements into tribal homelands. After the death of Massasoit, great sachem of the Wampanoag tribe of southeastern Massachusetts, these issues sparked a Native insurrection against the plantation at Plymouth that later spread throughout the region. Because the Bolton area was located on the northern frontier of New England, it was particularly vulnerable to Indian attack.

Government and Demography in the Colonial Period (1675-1775). The beginning of the Colonial Period was marked by King Philip's War (or Metacom's Rebellion), a regional conflict that pitted Native Americans against English colonists. Philip (Metacom), son of the Wampanoag sachem Massasoit, had been angered by the English expropriation of tribal lands near Plymouth. Further outraged by the death of his brother in colonial custody and the execution of several close associates, Philip led an insurrection of tribal groups against English settlements in Massachusetts, Rhode Island and Connecticut. King Philip's War broke out in 1675 in eastern Massachusetts. In July of that year, Philip carried his offensive to the west, battling colonial forces in Brookfield before joining the Pocumtuck tribe near Deerfield, Massachusetts (Holland 1855).

The apparent strategy of the Wampanoag sachem was to enlist the military and tactical assistance of Native communities throughout the region, and then destroy colonial outposts, pressing the English frontier back toward the coast. With a large Native population and productive locations for agriculture and fishing, the upper Connecticut River Valley offered a favorable stronghold from which to wage the campaign against the colonists. Those Native people who had befriended the English or were otherwise indisposed to conflict were put in an impossible situation, often becoming refugees or objects of suspicion in their own land. Many of the Nashaway Nipmucs were said to have moved west shortly before the outbreak of hostilities.

Even before King Philip's War began, the General Court of Massachusetts had debated security measures for settlements on the New England frontier. In 1667, each town was ordered to erect a fortification, or fort, of stone, brick, timber, or earth either enclosing the meeting-house, or in some other convenient place where women, children and the aged might be secured in case of sudden danger, whereby the soldiers might be more free to oppose an enemy (Hazen 1882). In the Bolton area, the garrison house on Wataquadock Hill was attacked in 1674 (MHC 1983).

Old Lancaster was attacked by a large contingent of Indians under the Narragansett sachem Quannopin during King Philip's War (Schultz and Tougas 1999). Despite having five fortified garrison houses, many settlers were killed or taken captive. In August 1675, eight people were slain, and in February 1676, fifty people were killed and others were taken prisoner. Among the prisoners was Mary Rowlandson, who spent her first night in captivity on George Hill and recounted her experience in *The Narrative of the Captivity and Restoration of Mrs. Mary Rowlandson*. All the existing buildings in Lancaster were torched during the second attack. Resettlement by many of the original settlers, including John Prescott, commenced a few years after the war (Worcester County 1879).

In the winter of 1675-1676, both sides in the conflict attempted to replenish supplies of food and arms. Philip attempted unsuccessfully to gain the support of the Mohawks in New York. In the winter of 1675-1676, the Narragansett tribe suffered profound casualties during the Great Swamp Fight in South Kingston, Rhode Island, a massacre that effectively ended their participation in the conflict.

Philip and his allies attacked towns in the Connecticut River valley during the summer of 1676. In the region as a whole, however, the tide turned against the insurgents. From the Housatonic River to Cape Cod, the Indians suffered significant losses as punitive colonial

expeditions and Aflaying armies@ hunted down Native combatants and refugees alike. Many Indians were captured while fleeing eastward to Rhode Island. Philip himself returned to Rhode Island, but was captured and executed at Mount Hope in August (Holland 1855).

Across southern New England, the resolution of King Philip=s War was followed by the rapid expansion of colonial settlements. In 1685 a second Lancaster meetinghouse was built on the site of the original one (Marvin 1879). While the communities of Old Lancaster followed the pattern of expansion, the threat of sudden attack by hostile Indian groups would not fully abate there until the mid-eighteenth century. Many tribes from homelands outside southern New England allied themselves with the French Canadians and other enemies of England. Indian attacks occurred in Lancaster in 1692 and 1695 during King William=s War (1688-1698). Twenty settlers, including the minister, were slain in 1697. Settlers readied themselves for Indian attack once more during Queen Anne=s War (1703-1713). In 1704, the town was divided into districts, each containing fortified houses where local settlers were to congregate in the event of an attack. The town was attacked by French and Indian forces in that year, when eleven garrisons existed. Despite defensive measures, the second meetinghouse was burned. In 1705 and 1710, the town was attacked again. By 1711, there were twenty-seven garrisons, of which twelve were in the Bolton area. Typically, garrison houses were large, existing colonial houses that were retrofitted with palisades, fencing and stockpiles of arms. ABlockhouses,@ however, were more like small fortresses, designed and built specifically for defensive purposes. The terms were often used interchangeably over the years. In Bolton, the garrison house sites recorded by the present reconnaissance include the Moore Garrison (183 Berlin Road), the Houghton Garrison (at the corner of Green Road and Bare Hill Road), and the Whitcomb Garrison (at Sugar Road and Golden Run Road, the subject of recent archaeological excavation). Whitcomb=s town history (1988) alludes to other houses that were used as garrison houses, but their exact locations are undetermined. They were probably the earliest, largest farmhouses in the early days of the town.

During King George=s War (1744-1749) and the French and Indian War (1749-1761), volunteers from Bolton participated in several campaigns (Whitcomb 1988).

By the late 1720s, approximately two-thirds of the former Nipmuc territory had been brought under government by colonial towns. English settlement roughly followed the river drainages that defined the landscape for the Nipmucs themselves. The ease of settling former Indian planting areas drew the English into the Algonquin settlement pattern in the towns laid out prior to King Philip=s War, including Lancaster, Mendon, Brookfield, and Worcester. Centered on broad valley lands, these towns eventually dominated the region, with newer towns such as Bolton occupying upland interstices and falling within the respective spheres of influence of the older settlements (Brooke 1989).

A third Lancaster meetinghouse was built in 1716 at the western end of the Old Common (Marvin 1879), and population increased once the danger of Indian attacks had dissipated. While in 1684 there were approximately 100 residents, by 1711 there were 458 (Marvin 1879). Many of the new inhabitants lived in areas outside of the original core area of settlement, including the eastern slope of George Hill and the areas that became Bolton, Berlin, and Harvard. A new section of territory, approximately 40 square miles in area, was added to the western Lancaster in 1713 (Worcester County 1879). By 1731, Lancaster was the oldest, wealthiest, and most populous town in newly established Worcester County. The conservative character of the town had been established early when residents Awarned away@ undesirable settlers (Marvin 1879).

Several ecclesiastical districts emerged in Old Lancaster, leading to the fission of new towns. After a petition, Bolton was incorporated in 1738. Town officials were appointed for various duties; they included a Highway Surveyors, Deer and Hog Reeves, an Assessor, a Culler of Hoops and Staves, a Sealer of Leather, a Surveyor of Shingles and Clapboards, an Inspector of Lime, an Inspector of Nails, a Measurer of Wood and Bark, a Gauger and Searcher of Tar, Pitch, Turpentine and Rosin, a Measurer of Grain, a Culler of Dry Fish, a Weigher of Onions, a Pound Keeper, a Surveyor of Flax-seed, an Inspector of Tobacco, and a Prover of Butter in Firkins. Engine Men, exempted from the poll tax, were to go forth, by night or day, and use their best endeavors to extinguish any fire that may happen in the Town@ (Whitcomb 1988).

Meetings were held in 1739 to determine the location of the first meetinghouse. In 1740, the community consisted of dispersed farms, with a new meetinghouse, town pound, parsonage, and inn at the geographic center of the town. The civic center was located on the Great Road, which had evolved from an ancient Indian trail and cart path to become the major east-west route through northeastern Worcester County. The first schoolhouse in Bolton was built in 1744 (Whitcomb 1988).

As relations between England and the American colonies worsened prior to the Revolution, some towns in New England attempted to reduce their dependence on imported goods. At a Bolton town meeting in 1770, townspeople voted Avery unanimously@ to boycott British goods (Whitcomb 1988).

The population of Bolton stood at 925 residents in 1765. By 1776, it had grown to 1,210 persons (Figure 4; Commonwealth of Massachusetts 1909).

Government and Demography in the Federal Period (1775-1830). In 1775, the town voted to purchase ten guns for unarmed citizens. With the outbreak of hostilities on April 19, 127 Bolton volunteers marched to Concord (Whitcomb 1988).

The South Parish of Bolton was formed in 1778. Six years later, it was incorporated as the Town of Berlin. By 1779, the Fryville community was established in the southern section of Bolton. The town center was designated as a mail stop and stagecoach layover location in the late eighteenth century. The Bolton and Lancaster Stage Company was established in 1827 (Whitcomb 1988).

By 1789, there were five schoolhouses serving different sections of the township. The preparatory Fry School was founded in 1823.

A community of Quakers began to hold monthly meetings in Bolton prior to 1790. The first of two Quaker meetinghouses was built at that time. The community grew in numbers, and in the late 1790s a second Quaker meetinghouse was constructed (MHC 1983).

During the War of 1812, the citizens of Bolton, like many other rural New England towns, chafed at the economic hardships caused by the Embargo Act of 1807. The legislation effectively blocked the export of American products. A petition of complaint was submitted in 1812. In order to consolidate the storage of munitions in the town, a powder house was constructed in the same year. Supplies that had been secreted away in the meetinghouse were transported to the powder house for storage.

The population of Bolton in 1790 included 861 persons, having been reduced slightly by the annexation of part of the town to Berlin in 1784 (Figure 4). By 1810, it had grown to 1,037, and by 1830 included 1,253 residents (Commonwealth of Massachusetts 1909).

Government and Demography in the Early Industrial Period (1830-1870). In 1831, the Town Farm of Bolton was established for the economically disadvantaged residents of the community (MHC 1983). As early as 1762, a workhouse had been built in the town, and impoverished persons were Avendued,@ or assigned to Bolton households for one-year periods to work in return for room and board (Whitcomb 1988).

Boston-to-Brattleboro mail service was established through Bolton in 1832 (Whitcomb 1988).

Henry David Thoreau passed through the town in 1842, later describing his journey in the essay AA Walk to Wachusett.@ The first library in Bolton was founded in 1859.

In 1861, at the onset of the Civil War, a bonus of one hundred dollars was paid to each Bolton volunteer who joined the forces of the Union. A total of 155 men answered the call, and 21 died during the conflict. Mary E. Haynes of Bolton served as a nurse, recording her experiences in a diary (Whitcomb 1988).

Counterfeiters were arrested in Bolton shortly after the Civil War. Philo Patch and his two sons obtained molds and cast Aspurious nickels,@ receiving one dollar for forty of the fake coins (Whitcomb 1988).

The population of Bolton declined slightly to 1,186 residents in 1840, following annexation of part of the town to Marlborough in 1829 (Figure 4). It remained stable during the mid-nineteenth century, standing at 1,263 in 1850 and growing gradually to 1,502 in 1865 (Commonwealth of Massachusetts 1909). The Town of Hudson annexed a section of southeast Bolton in 1868.

Government and Demography in the Late Industrial Period (1870-1915). In the years following the Civil War, manufacturing revenues declined in Bolton, and the population dropped with the closure of small industries (Figure 4; Whitcomb 1988). It fell to 1,014 residents in 1870, due in part to the annexation of part of the town to Hudson in 1868. It declined further, to 827 in 1890, and to 762 residents in 1905 (Commonwealth of Massachusetts 1909).

Government and Demography in the Modern Period (1915-2000). The construction of improved auto-highways was provided with federal funding during the 1920s. Typically, counties were provided money to widen existing main roads, so the highways often passed through the center of rural towns. In Bolton, construction of Interstate 495 in 1964 had more momentous implications. The main result was an increase in residential development in the town, a trend that has continued until the present time.

The population of Bolton reached its twentieth-century low in 1920, when there were only 708 residents (Figure 4). A modest increase was noted by 1940, with 775 residents. Residential development in the post-war era caused the population to grow to 1,264 persons in 1960 and 2,530 in 1980 (Wilkie and Tager 1991).

Archaeological Implications. Bolton contains a variety of public archaeological sites, related to the civic history of the town. The present reconnaissance has identified several types of site of which there are multiple examples in Bolton: meetinghouses, cemeteries, schoolhouses, and greens. Some of these are visible today, while others may be represented only by

archaeological deposits or features that are difficult to detect. Information concerning the archaeological implications for public archaeological sites is summarized in Table 4.

Archaeological sites such as the Bolton Town Common or Fiddler=s Green are easily recognized. Town commons typically date to the earliest days of town history, and may contain unmarked burials, agricultural tools, coins, buttons, and even evidence of military training exercises (Table 5). The location of a meetinghouse, often at a central place in a township or village, may have been redeveloped if the building has not survived into the modern period. In Bolton, however, the sites of the First and Second Quaker Meeting Houses (HA-1 and HA-31, respectively) are good examples of meetinghouse sites in lightly settled surroundings, where the potential for preservation of archaeological deposits is high. Artifact assemblages are likely to be low in density, and similar to those associated with churches. Stone foundations may also be present. The potential for unmarked burials is particularly high near Quaker meetinghouses, as the Quakers did not use grave markers. The numerous schoolhouses in Bolton were small wooden structures that were moved frequently during the nineteenth century. Buried stone foundations may still exist at various schoolhouse sites shown on the historic maps.

Cemeteries are rich sources of information about community history. Most of the cemeteries in Bolton have the benefit of regular maintenance and perimeter fences, and are easily recognized. Examples include the Old South Cemetery (MHC 800) and the Pan Cemetery (MHC 801). Even these are likely to contain unmarked burials, however, due to weathering and the removal of headstones over time. Other cemeteries are much more difficult to detect. The Quaker Cemetery (MHC 803) may not contain markers of any kind. Family plots, and smallpox cemeteries such as the one recorded in the Vaughn Hills Survey Unit (MHC 804), often contained a small number of burials and were forgotten or neglected over time. Poor families, Native Americans, and slaves often were unable to afford formal headstones, and used fieldstone markers instead. The vicinity of the Town Farm (HA-29) may contain burials of the latter variety.

Agriculture and Rural Life in Bolton (Residential and Agricultural Sites)

The character of agriculture and rural life in Bolton left an indelible mark on the historical development of the town. The initial selection of settlement locations was guided by the availability of land suitable for cultivation and pasturage, timber resources, and streams to power gristmills and sawmills. Ancient Indian trails traversed the landscape, linking clearings and planting fields with river crossings. These trails became familiar to colonial trappers and traders who were the first Europeans to visit the area, conducting trade with the Nashaway Nipmucs. In time the paths evolved into the first cart paths of Bolton, and later became the primary thoroughfares around which colonial settlement was oriented. The establishment of farmsteads by colonists, and the clearing and bounding of land, further altered the landscape.

Many of the historic architectural features of Bolton are related to early residences and farms. Similarly, many of the historic archaeological resources in Bolton are the legacy of the early farming families of the town, representing the sensibilities and adaptations they devised. The cellar holes of colonial dwellings, the stone foundations of barns, and rambling stone fences provide insights into this history.

Agriculture and Rural Life in the Plantation Period (1620-1675). Although colonial settlement of Old Lancaster commenced prior to 1650, the southeastern section of the plantation that became the Town of Bolton was not settled until ca. 1665. The availability of arable land, timber resources, and streams for water-powered sawmills and gristmills remained abundant in central Lancaster through the mid-seventeenth century. The constant threat of sudden attack by Natives also discouraged isolated, outlying settlement. In the Bolton area, isolated farmsteads included the house of John Moore on the east side of Wataquadock Hill (by 1665) and the house of Abraham Joslin on the west side of Long Hill (by 1670). The former dwelling, a garrison, was attacked by Native insurgents in 1674 (MHC 1983).

The farmsteads of Bolton during the Plantation period were few in number. They likely consisted of reinforced, defensible main houses with barns and outbuildings, occupying clearings with modest planting fields. During periods of peace, the settlers may have conducted trade with the Nashaway Nipmucs. The farmsteads were linked to Old Lancaster by a series of crude cart paths that evolved from Indian trails.

Agriculture and Rural Life in the Colonial Period (1675-1775). The settlement of Bolton increased slowly in the aftermath of King Philip's War. The ongoing threat of attack by Natives made it customary for houses to be reinforced for defensive purposes. In 1704, Bolton was divided into districts and each of its 146 residents was assigned to a garrison, where they were to report in the event of an attack. The community featured a dozen garrison houses by 1711 (Whitcomb 1988).

Bolton began to develop a distinct civic identity by the early eighteenth century. In 1706, residents submitted the first in a series of petitions seeking ecclesiastical separation from Old Lancaster. The difficulties posed by winter travel to compulsory religious services was a common complaint. The expense and logistical challenges of maintaining a series of eight bridges allowing passage over the Nashua River and its wetlands were another difficulty. David Whitcomb's Tavern was established ca. 1708. Other taverns and inns were established on the Great Road by 1718. Reconstruction of Bay Road was undertaken in 1734 (Whitcomb 1988).

Bolton was incorporated in 1738. In 1740, the community consisted of dispersed farms, with a new meetinghouse, town pound, parsonage, and inn at the geographic center of the town. The civic center was located on the Great Road, which had evolved from an ancient Indian trail and cart path to become the major east-west route through northeastern Worcester County.

During the Colonial period in Bolton, the local economy revolved around agriculture. Farmsteads typically consisted of main houses facing thoroughfares, accompanied by kitchen gardens, barns and outbuildings. Networks of stone fences defined property boundaries, planting fields, meadows, and woodlots. Cereal crops were transported to local gristmills, and the majority of produce was consumed locally. Livestock including cattle, sheep, and swine were raised, and outlying areas were used for pasturage.

Agriculture and Rural Life in the Federal Period (1775-1830). In the time between the Revolution and the early Industrial period, the economy of Bolton maintained an agricultural basis. As the population increased, new thoroughfares were laid out, enabling the settlement of more remote sections of the town. Improvements to turnpikes and main roads allowed the transport of produce and provided Bolton farmers with new markets in the region. Although most

goods and produce had been consumed locally before, the participation of Massachusetts in regional and international trade had a beneficial economic effect that filtered down to the populace of Bolton. Thus, the Embargo Act of 1807 caused financial strictures in the town. This stagnation was protested with a petition in 1812.

In an account published in 1793, a visitor to Bolton described the agrarian practices encountered in the town in the late eighteenth century: AThe town in general is good land, not level, nor yet has it any very high hillsY It is not very rocky, however there are stones sufficient to wall in all their farms. The people raise rye, wheat, Indian corn, barley, oats, flax upon their land [and] now mow considerable grassY@ (Whitney 1793).

By the 1820s, several stores in Bolton offered a wide variety of goods. Located on the Great Road at the town center, the Brick Store in 1820 offered A cotton, wool, linen, silk, paint, kerosene, grain, lanterns, coffee, tea, quills, gun powder, flints, umbrellas, furniture, tools, nails, glue, bread, sugar [and] dishes@ (Whitcomb 1988).

Agriculture and Rural Life in the Early Industrial Period (1830-1870). In the mid-nineteenth century, a wide variety of small industrial enterprises were established in Bolton. Although many of them failed, they cumulatively reflected the ethic of innovation and entrepreneurship that prevailed in rural New England at the time. The farmers of Bolton participated actively in this trend, experimenting with new techniques and crops. During the 1830s, several took part in a brief mulberry boom. In the 1840s and 1850s, crop experiments involved the cultivation of hops and tobacco. Silkworm culture flourished briefly. In 1845, fifty pounds of raw silk were produced in the town, although this industry proved to be impractical in the long term (MHC 1983).

The Great Road, being the primary east-west thoroughfare through northeastern Worcester County, served as an economic corridor during this period. It featured inns, taverns, stores and a mail stop. In 1828, an average of forty fully loaded wagons passed through the township, transporting goods to commercial centers in the region.

Agriculture and Rural Life in the Late Industrial Period (1870-1915). By the final quarter of the nineteenth century, agricultural activities in Bolton became increasingly oriented toward commercial production. The dairy industry expanded, with milk, cheese, butter and eggs produced for sale in urban centers. Orchards proliferated, and the town produced apples, cider and vinegar. Poultry production also increased (MHC 1983).

Unlike many towns in New England, Bolton did not have the benefit of railroad service through the town center, due to the financial failure of the Bolton and Lancaster Railroad in 1872. (The railroad was used once and then abandoned.) Freight had to be transported to and from the Ballville station of the Bolton and Lancaster Railroad, which ran through the southwest extremity of the town (by 1870), or the station of the Central Massachusetts Railroad (later the Boston & Maine) in south Bolton (1881). After 1900, the Clinton-Hudson Street Railway provided passenger service through Bolton.

Agriculture and Rural Life in the Modern Period (1915-2000). Apple orchards and dairy production continued to play a significant part in the agricultural sector of the Bolton economy. In 1925, a modern dairy plant was constructed.

Archaeological Implications. Bolton contains a variety of archaeological sites representing the residential and agricultural heritage of the town (Table 6). Recent, comprehensive studies of historic structures in the town have recorded dozens of significant buildings (Forbes 1998; Lima 1998). In the absence of evidence to the contrary, *it should be assumed that each historic structure in Bolton is accompanied by unique archaeological deposits that tell the story of its occupation and inhabitants.* Outbuilding foundations and features such as wells, privies and middens of historic refuse are likely to be present. Archaeological data, in concert with architectural study and archival research, enable the interpretation and fullest understanding of historic properties. The present reconnaissance has concentrated on ruins and subsurface evidence of rural life, identifying several types of site of which there are multiple examples in Bolton: garrison houses, barns and cart paths or disused roads. Information concerning the archaeological implications for residential and agricultural sites is summarized in Table 7.

Garrison houses typically were large, early colonial farmhouses to which Bolton residents were to report in the event of an Indian raid prior to the mid-eighteenth century. The John Moore Garrison (HA-60) is a surviving example of such a house. The Whitcomb Garrison (HA-8) is the site of another fortified building, which has been the subject of recent archaeological excavations. In general, the artifact assemblages associated with garrison houses are similar to those of contemporary domestic structures; evidence of an AIndian attack@ cannot be expected. Nonetheless, garrison house sites are of particular interest because of their antiquity. In some towns in southern New England, garrison houses were surrounded by wooden palisade walls and other modest fortifications. The identification of post mold features related to such defenses would be of great archaeological interest.

Barns were ubiquitous during the eighteenth and nineteenth centuries. Archaeologically, they typically are represented by large, rectangular stone foundations, sometimes set into hillsides or embankments, and are associated with historic residences. Examples in Bolton include the Moses H. Mentzer Barn (HA-88), the Green Road Barn (HA-84), and the Berlin Road Barn (HA-62).

Cart paths and disused historic roads have been recorded at several locations in Bolton. These often appear as footpaths, lined with stone fences and traversing historic pasturelands that have reverted to woods and underbrush. Examples include the Powder House Hill Road (HA-51), which linked the town center to Golden Run Road by way of the eastern foot of Powder House Hill, and the Sawyer Road extension, which connected Sawyer Road to Rocky Dundee Road on the south edge of the town. Such historic roads often fell into disuse when nearby thoroughfares were laid out or improved. However, they may indicate areas of previous settlement where house sites are located.

Industry and Commerce in Bolton (Industrial and Commercial Sites)

In many respects, the early industrial and commercial history of Bolton was typical for a rural community in Worcester County. At the founding of the town, agriculture was the focus of industrial infrastructure. Gristmills and sawmills were among the first structures completed in the town, and settlement locations were oriented around proximity to these facilities and the streams that provided them with water-power.

Although there are two significant water-power sources (the Nashua River and the Still River) in Bolton, these two rivers flow only through the extreme northwest section of the town,

leaving the rest of the town to rely on small brooks and streams for water-power. Thus, the early gristmills, sawmills, and single fulling mill of Bolton were constructed on small waterways such as the Mill (or Wataquadock) Brook in the southern section of town, the Great Brook in the central and east sections of town, and the Sawmill Brook in the western section of town.

Gristmills were generally the first type of mill built in New England villages because they were necessary for the grinding of corn, rye, wheat, and other cereal grains into flour. Once a gristmill was established, local villagers brought their corn and grain to be processed and typically paid the miller with a portion of the processed flour (Hamilton 1964:3).

Sawmills were also an important part of the village economy because they provided lumber for building purposes. Because early roads were poor, or even lacking, transport of lumber across great distances was difficult. Thus, most New England towns had one or more sawmills to supply the local population with lumber for building (Hamilton 1964:4).

The fulling mill was the third type of early mill needed in the New England village economy. When hand-woven cloth comes from the loom its separate threads are quite distinct, and, if made of wool, it still contains excess oils and grease and lacks compactness. The fulling process removes these oils and meshes the fibers of the separate threads together into a denser and more compact mass. At the same time it shrinks the cloth materially, sometimes into as little as half its original length (Hamilton 1964:18).

The first mills in Bolton, a sawmill and gristmill located on Wataquadock Brook (HA-67 and HA-68), were operated by members of the Sawyer family by 1739. The number of local mills increased with the construction of Samuel Baker's Saw Mill (HA-37) in the east part of town by 1765, and the Lower Mill (HA-70), constructed on the Sawmill Brook by the 1770s.

The sawmill and gristmill on Wataquadock Brook (HA-66 and HA-67), acquired by Capt. Amory Pollard from the Sawyer family, continued in operation during this period. In the 1790s Benjamin Sawyer acquired the former Baker Saw Mill (HA-37). He also operated a gristmill (HA-36). In the west part of town, Benjamin Morse was operating the gristmill on Sawmill Brook (HA-70) by 1792. By about 1815, Joel and Joab Barnard were operating a sawmill (HA-78) and turning lathe on Sawmill Brook. Bolton's single fulling mill (HA-32), located on a tributary of the Great Brook, was in operation by 1794. One sawmill (HA-9), built between 1831 and 1833 by Joel Sawyer, was located on Great Brook at the center of town. Another sawmill (HA-71) was constructed on Sawmill Brook around 1831 by Sampson Wilder.

Comb making began in Bolton in 1820 (Bolton Historical Commission Narrative History 2000). It was once an important industry in Bolton, primarily during the first half of the nineteenth century. Combs of animal horn and tortoise shell were manufactured both by hand and by machine. The horn was made workable by soaking it and then treating it with oil. Combs were produced in factories and in shops. There were several small shops throughout Bolton that were operated either out of a small building attached to the home or in a room within the home. Many people produced combs as a sideline or as a winter occupation. Several comb factories (HA-23 and HA-24) used waterpower to run the machinery. The Still River Road Comb Factory (HA-24) was three stories high and was probably Bolton's largest factory.

In the colonial period in Bolton, farmers produced goods, crops, and livestock for consumption in the local economy. Most did not participate greatly in regional markets, due to relatively low agricultural productivity. By the last quarter of the eighteenth century, however,

the region witnessed a transformation from an economy based on local exchange to a focus on central places (Wood and Steinitz 1997).

During the seventeenth and eighteenth centuries, cottage industries in Worcester County were a nearly universal component of the household economy. Family members supplied their own needs and those of their neighbors by producing such essential items as cloth and clothing, hats, various farming and domestic utensils, tubs and pails, and tools (Steinitz et al. 1985). However, the retaliatory measures of non-consumption and non-importation of British goods brought about by the Revolutionary War furthered the development of cottage industries, such as the production of homespun (Wood and Steinitz 1997). Goods were made for sale outside the local area. The employer was a shopkeeper or merchant who provided materials such as straw, palm leaves, shoe parts, and textiles and later sold the finished products. Initially carried out during lulls in domestic or agricultural activities, cottage industries often surpassed agricultural production in its economic status within a household (Steinitz et al. 1985). These industries were complemented in many towns by an increasing diversity of manufacturing concerns, such as comb shops and carding mills, which were often geared for export to regional and international markets. By the second quarter of the nineteenth century, Bolton had developed a noteworthy array of small industries. Today, many of these are represented among the historic archaeological resources in the town.

Industry and Commerce in the Plantation Period (1620-1675). In the Bolton area of Old Lancaster, no early industries were known to have existed during the Plantation period. Garrison houses, probably associated with small farms, were located on Wataquodock Hill and Long Hill. The settlers may have conducted trade transactions with the Nashaway Nipmuc Indians; the first settler in Lancaster had established a trucking house for this purpose, and the tradition may have continued on a small scale in the Bolton area as well (Marvin 1879).

Industry and Commerce in the Colonial Period (1675-1775). By the late seventeenth century, the inhabitants of Old Lancaster who lived on the east side of the Nashua River became more autonomous from their parent community. The construction of sawmills and gristmills in the Bolton area enabled this process. Small tanneries and blacksmith shops went into operation in the early eighteenth century. Taverns and inns took advantage of the location of Bolton on the Great Road. The David Whitcomb Tavern opened ca. 1708. Inn licenses in Bolton were also obtained by Thomas Ball (1738), Josiah Richardson (1740), and Daniel Greenleaf (1750) (Whitcomb 1988).

Local interest in the extraction of raw materials continued. An ochre mine was worked on the north side of Long Hill, and colonial prospectors unsuccessfully explored the bowels of Wataquodock Hill. Potash was extracted from at least two locations by the late eighteenth century, and pearl-ash, a fertilizer made from wood, was also produced in Bolton. Easily the most successful enterprise of this kind was the quarrying and processing of limestone. This began on the north side of Rattlesnake Hill in the early 1700s, but greatly increased in 1736 when the Whitcomb family commenced limestone operations in East Bolton. The stone was quarried, fired, and processed on site, leading to the production of up to 20,000 bushels per year. Features associated with the limestone complex included a lime house for processing and storage, a

lime kiln, and a series of quarry pits. Only the second operation of its kind in New England, the quarry operation remained in business for well over a century (MHC 1983; Whitcomb 1988).

Industry and Commerce in the Federal Period (1775-1830). After the Revolution, the lime quarry, tanneries, and blacksmith shops in Bolton continued to operate. Two brickyards were established in northwestern Bolton, on the east side of the Nashua River. A brick inspector was appointed, and in 1793, the town produced 200,000 bricks. A fulling mill went into operation during the 1790s, and a hat-maker and pair of tanneries were located on Wataquadock Brook by the turn of the nineteenth century.

In an account published in 1793, a visitor to Bolton described the search for raw materials witnessed in the town in the late eighteenth century: "At a small distance from the foot of Wataquadock begins another large hill called Bear Hill [or] Oak Hill. This hill is thought to contain mines and minerals and has engaged the attention of a respectable society of mine-seekers, but their expectations have exceeded their gains; for though its bowels have been explored with much painful labor and much sanguine hope, yet the mountain has not brought forth a mouse" (Whitney 1793).

The manufacture of combs was a successful venture during this period. In water-powered comb shops, horn and tortoise shell were soaked, treated with oil, and then shaped and sawed into combs. Five such shops were located in Bolton in the early nineteenth century, producing \$21,000 worth of product annually. Buttons were manufactured as well (Whitcomb 1988).

Cooper shops in Bolton provided barrels to local farms. Blacksmiths and wheelwrights collaborated with carriage makers and wagon makers to produce conveyances that were used to transport passengers on the Great Road and to haul produce.

This traffic supported taverns and inns on the Great Road. Inn-holder licenses were held by Thomas Osborne (ca. 1790), Colonel Caleb Wheeler, and dozens of others. Tavern licenses or liquor permits were obtained by William Woodbury (from 1827-1835), Stephen Gardner, and C. C. Moore. The Holman-Whitcomb Inn and the Woodbury Tavern also flourished during this period. On Sundays at the latter location, parishioners partook of a bit of spirituous refreshment between the long morning and afternoon sessions of spiritual refreshment in the Meeting House across the road. In 1827, the Bolton and Lancaster Stage Company was established (Whitcomb 1988).

Industry and Commerce in the Early Industrial Period (1830-1870). The number of small industries in Bolton proliferated at a dizzying rate in the mid-nineteenth century. The manufactories of the Federal period were joined by boot and shoemaking concerns, which employed forty people and produced 21,000 pairs of footwear ca. 1837. A small mill produced shoeboxes for the Bolton Shoe Company, located at the town center by 1853. At mid-century, tobacco raised in the town was used to make snuff and cigars.

Cards for the processing of wool were produced after 1830, with 20,000 pairs manufactured in 1836. Other enterprises manufactured pumps, plows, saddles, trunks, harnesses and hats. At the town center by the early 1830s were a mechanics' shop and a small shop for the manufacture of jewelry and watches.

In the mid-1830s, one of the sawmills or shingle mills of Sampson Wilder was converted into a sash-and-blind factory. Cabinet-ware was also manufactured. Lumber production remained

an important industry in Bolton; in 1865, four sawmills produced half a million linear feet of boards.

A compulsory enrollment of citizens in 1862 recorded the occupations of all Bolton men between the ages of eighteen and forty-five. Residing in the town in that year were ninety farmers, sixty-nine shoemakers, twenty-three laborers, ten carpenters, three machinists, three blacksmiths, three students, three merchants, three painters, two surgeons, two traders, and one of each of the following: butcher, harness maker, comb maker, hostler, shoe manufacturer, cigar maker, teacher, bricklayer, basketmaker, carriage maker, bookkeeper, miller, clerk, postmaster, hoopskirt maker, and gentleman (Whitcomb 1988).

Industry and Commerce in the Late Industrial Period (1870-1915). The economic devastation of the South resulting from the Civil War caused a decline in manufacturing revenues in Bolton after the 1860s. The failure ca. 1875 of a railroad line that would have provided service to central Bolton made the transport of manufactured goods more difficult. The Agricultural Branch Railroad did serve the southwest extremity of the town after 1866.

Although several of the small industries that had emerged in the mid-nineteenth century continued to operate, it was agricultural activity that witnessed economic expansion in Bolton after 1870. The dairy industry was particularly successful.

Industry and Commerce in the Modern Period (1915-2000). The production of apples from orchards in Bolton remained a successful enterprise. A modern dairy processing plant was opened in the town in 1925, and the raising of poultry increased. During the 1930s, the dormant lime quarries were reopened as a source of material for fertilizer. A single-runway airport was located in western Bolton from ca. 1930 until 1951.

The town did not develop a large manufacturing sector during the twentieth century. Instead, agricultural production was emphasized, complemented increasingly by residential development with the improvement of auto-highways after mid-century.

Archaeological Implications. The historic archaeological record in Bolton contains many examples of industrial and commercial sites, evidence of enterprises that flourished prior to the late nineteenth century (Table 8). There are multiple examples of archaeological sites representing sawmills, gristmills and tanneries. Historic maps also provide the locations of brickyards, comb and shoe manufacturing shops, and taverns (Figures 6-13). Information concerning the archaeological implications for industrial and commercial sites is summarized in Table 9.

In Bolton, as in most other Massachusetts towns, sawmills and gristmills were the first industrial facilities constructed. They often were located in proximity to one another, and are represented today by stone masonry walls, stone or earthen milldams, millponds, headraces, tailraces, water diversion features, and sluice gates (Table 9). Examples include the Mill Brook/Thomas Sawyer Saw Mill (HA-66) and the Samuel Baker Saw Mill (HA-37). Gristmills include the Lower Mill (HA-70) and the Mill Brook Grist Mill (HA-67). Tanneries were frequently located on streams, and were accompanied by small ponds. At the Berlin Road Tan House (HA-57), a sluice gate is visible.

ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL

The project area, consisting of the Town of Bolton, Massachusetts, was divided into seven survey units during the background research for this project (Figure 3). These survey units were designed to facilitate the field survey as well as the discussion of archaeological potential. The choice of boundaries revolves around the potential of the individual survey units to be eligible as historic districts. It is hoped that should National Register districts be desired in the future, the text provided below, and in the historic contexts sections above will be of use to the historical commission and town planners. The survey units include: Bolton Center, Still River, Vaughn Hills, East Bolton, Ballville, Fryville, and Hudson Road.

As historical and archaeological information was gathered during the present community-wide reconnaissance, Archaeological Services assigned *temporary archaeological site numbers* to known and inferred site locations in chronological order of their recording. In some cases, sites had previously been reported to the MHC. A list of all sites recorded during the project is provided in Table 10. In the following text, the names of archaeological sites are followed by site numbers assigned by the MHC. These numbers correspond to the survey unit maps and tables included in this report.

Bolton Center Survey Unit

Boundaries. This survey unit is located in the central section of Bolton (Figure 3). It is bordered on the west by Old Bay Road north of Wataquadock Hill Road and Wilder Road north to its intersection with Route 117. It is bordered on the north by the pipeline corridor between Nourse and Harvard Roads, then Harvard Road north to Golden Run Road and Interstate 495, south along Interstate 495 to Burnam Road, and east to Route 117. The eastern edge of the survey unit is drawn along Meadow Road, south from Route 117 to Long Hill Road, and then in a line between West and Little Ponds, west to Interstate 495. The southern edge of the Bolton Center Survey Unit is drawn from I-495 along South Bolton Road to the intersection with Berlin Road, and then west to the intersection of Old Bay Road and Wataquadock Hill Road. This survey unit is depicted on the Hudson (1997) USGS 7.5 H 15-minute quadrangle, and on earlier 7.5-minute Hudson (1943, 1979) topographic quadrangles.

The Bolton Center Survey Unit includes the Bolton Center National Register Historic District, as well as sections of the Pan, Nashaway, and Wataquadock Hill Vistas and Farms historic landscapes detailed in the Preservation Plan for the Town of Bolton (Lima 1998).

Topography. The topography of the Bolton Center Survey Unit is primarily hilly, interrupted by the upper sections of Great Brook and Sunk Meadow Brook. The western part of the survey unit includes the northern section of Wataquadock Hill, at an elevation of 192 m (630 ft), descending to the east into the headwaters of Great Brook, and center of Bolton. The northern part of the survey unit includes all of Powder House Hill, which reaches 168 m (551 ft), and three branches of Great Brook, which drain to the south into Bolton center. The eastern part of the survey unit includes the southernmost arm of Rattlesnake Hill, and the streambed of Great Brook, as well as West Pond. The southern part of the survey unit consists of Sunk Meadow, which drains to the south, and an eastern arm of Wataquadock Hill. In the center of the survey

unit is Bolton Center itself, which lies in the small swale along Great Brook, between Powder House Hill and Wataquadock Hill. Elevations within the survey unit range from a low of 87 m (285 ft) at the eastern edge of the Great Brook drainage, to a high of 192 m (630 ft) on Wataquadock Hill. The community center lies at between 117 and 126 m (384 to 413 ft).

Water Sources. The Bolton Center Survey Unit includes two different freshwater systems, which offer a number of different sources for obtaining potable water. The Great Brook system has three main arms, one of which drains the south side of the unnamed hill between Harvard and Nourse Roads, another which drains the west side of Powder House Hill, and the third of which drains the east side of Powder House Hill. The western two arms drain south, joining on the north side of Main Street, and flowing east, where the third arm joins at the Pan. West Pond is a dammed section of another smaller arm of Great Brook. The second water source is the upper section of the Sunk Meadow drainage, which is filled by runoff from the east side of Wataquadock Hill, and flows south and east into Mill Brook.

Soils. Soils in this survey unit are somewhat favorable for the presence of Native American archaeological sites. Due to the hilly terrain, there are no large areas of flat soil development (0 to 3 percent slopes). There are, however, substantial areas of gently sloping (3 to 8 percent) terrain, which include well-drained soils. Areas around Sunk Meadow include Merrimack fine sandy loam, Hinckley sandy loam, and smaller areas of Windsor loamy fine sand and Paxton fine sandy loam, all of which are favorable for settlement and agriculture (Taylor and Hotz 1985). The terraces on the east sides of both Wataquadock Hill and Powder House Hill include well-drained soils, primarily Paxton, but also small areas of Merrimack and Hinckley soils. The other favorable location is the flat top of Wataquadock Hill, north of Old Bay Road, which is moderately well drained Woodbridge fine sandy loam, and is suitable for agricultural purposes, and settlement during dry times of the year, but is often wet in the spring. The remaining hill slopes are comprised of Chatfield-Hollis rock outcrops, which are rocky. The drainage beds of Great Brook and Sunk Meadow are classified as primarily Freetown muck, with smaller areas of Scarboro mucky fine sandy loam, both of which are poorly drained.

Recorded Native American Sites. No Native American sites have been recorded within the Bolton Center Survey Unit.

Recorded Historic Sites. See Figures 5a and 5b for mapped site locations (USGS 1997).

The Town Center Meeting House (HA-4). The Town Center Meeting House was shown on the historic maps of 1794, 1831, and 1857, north of the Great Road. It was noted by Whitcomb (1988:95-98). After some debate in 1739, the founders of Bolton agreed that the place to set up the House of God To meet in, Shall be on the Nole Nearest to the Barn called the Widdow Townsends Barn@ (Whitcomb 1988:96). This building is standing today.

The Town Pound (HA-5). The Town Pound was previously recorded as MHC Historic Site HA-5, and was referred to by Whitcomb (1988:24).

The Whitcomb Garrison (HA-8). The Whitcomb Garrison was previously recorded as MHC Historic Site HA-8, and was referenced by Whitcomb (1988:9). It was the subject of an academic excavation project conducted in 1988 under advice from Dr. Donald Brown of Boston University. Dr. Jeffrey Brain of Harvard provided expertise on pottery. The project was directed by Linda Engelmann.

The Town Center Saw Mill (HA-9). The Town Center Saw Mill was shown on the historic map detail of 1870. It was located on the millpond just south of Main Street. It was constructed by Joel Sawyer between 1831 and 1833 and was in use for many years (Whitcomb 1938:200; Whitcomb 1988:224).

The Baptist Church (HA-10). The Baptist Church was shown on the historic map detail of 1870.

The Bolton Center Store (HA-11). The Bolton Center Store was shown on the historic map detail of 1870.

The Lancaster Railroad 51 (HA-12). A section of the Lancaster Railroad (1871-1889) ran through the Bolton Center Survey Unit.

The Simeon Hemenway Tannery (HA-13). The Simeon Hemenway Tannery was referred to by Whitcomb (1988:224). Residential houses were built on this site.

The Moses Wilder Blacksmith Shop (HA-14). The Moses Wilder Blacksmith Shop was referred to by Whitcomb (1988:235). It was moved to Old Sturbridge Village. The site of the shop was excavated archaeologically by Sturbridge Village in 1957. The house was used also as an icehouse (Lima 1998:61).

The Manor Road Button Shop (HA-15). The Manor Road Button Shop was referred to by Whitcomb (1988:248). The condition of this site is unknown.

The Bolton Center Shoe Shop (HA-16). The Bolton Center Shoe Shop was shown on the historic map of 1857. A building is at this location.

The Col. Robert Longley Brickyard (HA-19). The Col. Robert Longley Brickyard is located near 610 Sugar Road. It is suggested by Whitcomb (1988:230) that the clay may have been obtained from the brook behind his house. The brickyard provided bricks for a fireplace at the North East School in 1788-1790.

The Universalist Church (HA-20). The Universalist Church was shown on the historic map detail of 1870.

The Bolton Center Post Office (HA-21). The Bolton Center Post Office was shown on the historic map detail of 1870. A stagecoach and mail stop was established near this location prior to 1800.

The Engine House (HA-25). The Engine House was shown on the historic map of 1831. It was referred to by Whitcomb (1988:224). Mentioned in an 1833 deed, it likely housed the Quickstep, Bolton's first fire-fighting apparatus. Houses are in this location today.

The Wagon Factory (HA-34). The Wagon Factory was shown on the historic map of 1898. The manufacture of wagons and carriages began in Bolton earlier in the nineteenth century. This site was at the location of Pond Park. When the machine shop was in operation this property was owned by W.H. Dow. Maloney's carriage painting shop and a woodworking shop were located on buildings over the pond. Many mill components are intact, preserved by Pond Park, which was established in 1905 by the Village Improvement Society.

The Samuel Baker Tannery (HA-35). The Samuel Baker Tannery was referred to by Whitcomb (1988:229). The earliest tannery in Bolton, it was established in 1750 and served as part of Baker's early mill complex. The tannery remained in operation until at least 1770. A large gravel pit at this location may have destroyed this site.

The Benjamin Sawyer Grist Mill (HA-36). The Benjamin Sawyer Grist Mill was shown on the historic maps of 1794 and 1831. It was previously recorded as MHC Form 930 and part of MHC Form 64. It was noted by Whitcomb (1988:224). Sawyer built the gristmill ca. 1791 on West Pond, near a sawmill (HA-37) he had purchased. His descendants used the sawmill until the late 1800s.

The Samuel Baker/John Sawyer Saw Mill (HA-37). The Samuel Baker/John Sawyer Saw Mill was shown on the historic maps of 1794, 1831, and 1857. It was previously recorded as part of MHC Form 64, and was noted by Whitcomb (1988:224). Built ca. 1750 on a small seasonal stream that flowed into Great Brook, it was sold to Benjamin Sawyer with a house and tannery in 1791. His son John continued the use of the sawmill.

The Pan No. 2 School House (HA-38). The Pan No. 2 School House was shown on the historic map of 1831. The school was considered new in 1867 (Whitcomb 1988:180), but was not mapped by Beers in 1870. Beers' actual survey predated construction. This area is undeveloped.

The Noah Bacon Blacksmith Shop (HA-39). The Noah Bacon Blacksmith Shop was located in the Pan west of the cemetery (Lima 1998:12). It is shown on the Beers map of 1870.

The Town Center Potash Works (HA-40). The Town Center Potash Works was shown on the historic map of 1794. It was previously recorded as MHC Form 947. Potash is either potassium carbonate from wood ashes, used as a fertilizer, or a potassium compound used for iron smelting and other industrial purposes. This was one of two locations where potash was

obtained in Bolton during the eighteenth century. This site is located on the west side of the Bolton firehouse property, and is a fieldstone circle, probably a foundation (Forbes 1998).

The Ichabod Smith Cooper Shop (HA-41). The Ichabod Smith Cooper Shop was located in the Pan and appears to have been destroyed by construction of highway I-495 (Lima 1998:12-31).

The Sons of Temperance Hall (HA-50). The Sons of Temperance Hall was shown on the historic map detail of 1870, and was referred to by Whitcomb (1988:264). A building is at this location today.

The Powder House Hill Road (HA-51). The Powder House Hill Road is a footpath running from north to south, on the east side of Powder House Hill. It is shown as a road on the 1831 map.

The Bolton Center Railroad Station (HA-52). The Bolton Center Railroad Station was referred to by Whitcomb (1988:64).

The Maynard Brickyard (HA-53). The Maynard Brickyard was referred to by Whitcomb (1988:230). This site was not visited during the survey.

The Center No. 1 School House (HA-86). The Center No. 1 School House was shown on the historic map of 1831. The school was removed in 1861 to the location of the Baptist Meetinghouse (Whitcomb 1988:181-182). The site is not developed.

The Bolton High School (HA-89). The Bolton High School was shown on the historic map detail of 1870.

The Bolton Center Old Tavern (HA-90). The Bolton Center Old Tavern was shown on the historic map detail of 1870. Earlier in the nineteenth century, this establishment catered to the needs of stagecoach passengers and townspeople.

The Barrett Brickyard (HA-91). The Barrett Brickyard was operated by Oliver Barrett in the late 1780s and early 1790s. The yard may be located near 233 Long Hill Road. Barrett also provided bricks for the North East School fireplace (Whitcomb 1988:230).

The Old South Cemetery (MHC 800). The Old South Cemetery, the town's first cemetery, was established in 1739, and was first shown on the historic map of 1831. The land was donated by William Sawyer, who was also the first person buried there (1741). Originally 2 acres in size, the cemetery was extended in the north and northwest with additional land purchases. There are reportedly several Revolutionary War veterans' graves located there. Many of the headstones that were recorded in Bolton's Vital Records in 1910 were missing by 1988 (Whitcomb 1988:145-146). It was previously recorded as MHC Form 800.

The Pan Cemetery (MHC 801). The Pan Cemetery, originally known as the East Burying Ground, was first shown on the historic map of 1831. It is one of two cemeteries established in 1822 when the Old South Cemetery (MHC 800) had reached capacity. The land, consisting of 1 acre on Great Road (now Main Street), was donated to the town in 1822 by Oliver Barrett. In 1863 an additional strip of land to the west was added. Six Bolton men who fought in the Revolutionary War are buried there. It was previously recorded as MHC Form 801.

The Powder House (MHC 913). The Powder House was shown on the historic map of 1831. It was previously recorded as MHC Form 913, and was referred to by Whitcomb (1988:385-386). Constructed of brick, the Powder House was built in 1811 so that the town's stock of powder and balls could be moved from their storage place under the pulpit. The small structure was restored in 1975. This building is standing today.

The Old Settlers' Tomb (MHC 929). The Old Settlers' Tomb was previously recorded as MHC Form 929.

Archaeological Services Survey. During the reconnaissance at the Bolton Center Survey Unit, the Samuel Baker Saw Mill (HA-37) and the Benjamin Sawyer Grist Mill (HA-36) were viewed. A high concentration of historic structures and historic archaeological sites are located on the Great Road at the town center. In the absence of evidence to the contrary, such as paving or ground disturbance, it is assumed that the house lots of all historic buildings in Bolton possess high potential for archaeological resources such as sheet middens of domestic refuse, stone-lined wells, privies, or buried foundations. Consequently, site numbers were generally not assigned to standing structures. The well-maintained Old South Cemetery (MHC 800) overlooking Sunk Meadow was viewed. The site of the Whitcomb Garrison (HA-8) was also visited. At this site, the foundation of the house was the subject of a recent archaeological research project. It is presently visible and open to the public.

Still River Survey Unit

Boundaries. This survey unit is located in the northwestern section of Bolton (Figure 3). It is bordered on the west by the town line with Lancaster. The north side of the survey unit is formed by the town lines of Lancaster and Harvard. The eastern edge of the survey unit is drawn from the northern edge of town along Still River Road to Vaughn Hill Road, and south along Vaughn Hill Road to Green Road. The survey unit then runs northeast along Green Road and south along Nourse Road to Main Street. The southern edge of the Still River Survey Unit is drawn from Main Street southwest along Wilder Road to the Lancaster town line. This survey unit is depicted on the Hudson (1997) USGS 7.5 H 15-minute quadrangle, and on earlier 7.5-minute Clinton (1943, 1979) and Hudson (1943, 1979) topographic quadrangles.

The Still River Survey Unit includes a large section of the Nashaway historic landscape detailed in the Preservation Plan for the Town of Bolton (Lima 1998).

Topography. The topography of the Still River Survey Unit is divided: flat and low in the northwestern section, and hilly in the remainder. The Nashua River flows in a northeasterly

direction through the northwestern most section of the town, and the Still River runs in a parallel direction to the east. Almost all of the lands to the west of Still River Road are flat and low, mostly below 75 m (246 ft). The area between Still River Road and Vaughn Hill Road, north of Main Street is dominated by a large flat plateau at 120 m (394 ft), on which the high school now stands. To the south of Main Street, the southern part of the survey unit includes the northern most section of Wataquadock Hill, descending from 153 m (502 ft) to a low of 75 m (246 ft) along Forbush Mill Road and Forbush Brook.

Water Sources. The Still River Survey Unit includes a variety of water sources, all part of the greater Nashua drainage system. Both the Nashua and Still River flow through this survey unit, toward the northeast, with the Still River joining the Nashua just to the north of the town line in Harvard. Two streams in this survey unit contribute to the flow of the Still River before it enters the Nashua. An unnamed stream flows down the south side of Vaughn Hill, turning west and then north, and flowing down the west side of Nashaway Road and under Still River Road into the Still River. Forbush Brook collects runoff from the north side of Wataquadock Hill, as well as the south side of the hill overlooking Nourse Road, flowing along a section of Main Street, then along Forbush Mill Road into Lancaster. Several areas along Forbush Brook were dammed in the past for industrial uses, forming reservoirs that still remain.

Soils. Soils in this survey unit are very favorable for the presence of Native American archaeological sites. Although most of the area between the Nashua and Still Rivers is only poorly or moderately drained, the terraces to the west of the Nashua River and east of the Still River are highly favorable. These terraces consist of sizable formations of Hinckley sandy loam, Merrimack fine sandy loam, and Windsor loamy fine sand, all of which are favorable for settlement and agriculture (Taylor and Hotz 1985). This flat, well-drained terrace is cut by Forbush Brook, and continues south into the Ballville Survey Unit. Some areas of this terrace have been disturbed by gravel operations and development. The western slopes of Vaughn Hill are rocky and steep Chatfield-Hollis soils. The northern slopes of Wataquadock Hill include well-drained soils, primarily Paxton, but also moderately well-drained Woodbridge fine sandy loam, and are suitable for agricultural purposes, and settlement. The drainage beds of the rivers and brooks are classified as Limerick silt loam, Saco silt loam, Scarboro mucky fine sandy loam, Raynham silt loam, and Walpole fine sandy loam, all of which are poorly drained and unfavorable for settlement or agriculture.

Recorded Native American Sites. The Still River Survey Unit contains five previously recorded Native American sites. One locus, the Powers Locus is a recently reported portion of existing site 19-WR-353. .

The Farrell Still River M-12 Site (19-WR-351). The soil type is Merrimack fine sandy loam (a well-drained glacial outwash deposit) with slopes ranging from 3 to 8 percent. This soil is often associated with prehistoric sites throughout the state. The elevation of the site is 70 m (230 ft) above sea level in an open rural area. Reported artifacts include Brewerton Notched (4,079 to 4,900), Squibnocket Triangles (4,000 to 5,400 years ago), and Small-Stemmed and Small Pentagonal points (2,800 to 5,075 years ago). Edge tools, cores, and lithic debris also

are reported. The artifacts reported from this site are in the Dale Farrell collection. The site was occupied on several occasions by prehistoric peoples during the Late Archaic period, a time span between 5,000 and 3,000 years ago. The subsurface condition of the site is unknown and a site examination would be needed to determine it.

The Farrell Still River M-11 Site (19-WR-352). A large wetland abuts the site. The soil type is Windsor fine sandy loam (a glacial outwash soil that is well drained) with slopes ranging from 0 to 3 percent. This soil is often associated with prehistoric sites throughout the state. The elevation of the site is 81 m (265 ft) above sea level in an open rural area. Reported artifacts include Brewerton Notched (4,079 to 4,900), Squibnocket Triangles (4,000 to 5,400 years ago), and Small-Stemmed points (2,800 to 5,075 years ago). Other artifacts include broken point tips, edge tools, pounding stones, bifaces, ground stone gouges, and an adze. The artifacts reported from this site are in the Dale Farrell collection. The site was occupied on several occasions by prehistoric peoples during the Late Archaic period, a time span between 5,000 and 3,000 years ago. The subsurface condition of the site is unknown and a site examination would be needed to determine it.

The Farrell Still River M-33 Site (19-WR-353). The soil type is Windsor fine sandy loam (a glacial outwash soil that is well drained) with slopes ranging from 0 to 3 percent. This soil is often associated with prehistoric sites throughout the state. The elevation of the site is 78 m (256 ft) above sea level in a wooded rural area. Gravel quarrying activities have disturbed parts of the site. Reported artifacts include Small-Stemmed and Small Pentagonal points (2,800 to 5,075 years ago), Atlantic (2,700-4,000 years ago), Susquehanna Broad points (3,300 to 3,600 years ago), an Orient Fishtail point (2,700-4,000 years ago), and a Levanna point (400 to 1,600 years ago). Other artifacts include broken point tips, a knife blade and two chert scrapers. The site was occupied on several occasions by prehistoric peoples through the Late Archaic period and Late Woodland period, a time span between 5,000 and 400 years ago. The subsurface condition of the site is unknown and a site examination would be needed to determine it.

The Powers Locus of 19-WR-353. Information concerning this locus was contributed during the present survey and is added to the existing site form. The site is an activity locus encompassed by the boundaries of site 19-WR-353. The soil type is Windsor Loamy fine sand (a well-drained glacial outwash deposit) with level terrain. Windsor soil often is associated with prehistoric sites throughout the state. The elevation of the site is 78 m (360 ft) above sea level in an open rural area. Reported artifacts include Brewerton Notched (4,079 to 4,900 years ago), Squibnocket Triangles (4,000 to 5,400 years ago), and Small-Stemmed and Small Pentagonal points (2,800 to 5,075 years ago), Susquehanna Broad (appx. 2,700 to 3,200 years ago) and Orient Fishtail (appx. 2,800 years ago). Raw materials are predominantly quartz, with some rhyolite and chert. Edge tools and lithic debris also are reported. The artifacts reported from this site are in the collection of John C. Powers of Bolton. The site was occupied on several occasions by prehistoric peoples during the Late Archaic through Woodland periods, a time span between 5,000 and 2,800 years ago. The

subsurface condition of the site is unknown and would require a site examination to determine it.

The Farrell Still River Intersection Site (19-WR-356). The soil type is Windsor fine sandy loam (a well-drained glacial outwash soil) with slopes ranging from 3 to 8 percent. This soil is often associated with prehistoric sites throughout the state. The elevation of the site is 74 m (243 ft) above sea level in an open rural area. This site is reported by avocational archaeologist Dale Farrell of Bolton, but has not been collected. Thus, artifact styles and the time of occupation are unknown at present. The subsurface condition of the site is unknown and would require a site examination to determine it.

The Still River Road Site (19-WR-544). The soil type is Windsor fine sandy loam (a glacial outwash soil that is well drained) with slopes ranging from 0 to 3 percent. This soil is often associated with prehistoric sites throughout the state. The elevation of the site is 81 m (265 ft) above sea level in a wooded rural area. Gravel quarrying activities are evident to the northeast of the site. The site was discovered during an archaeological survey conducted by the Office of Public Archaeology at Boston University during a survey for a gas pipeline replacement. The site is located beneath 2 ft of fill (Jones et al. 1992). Reported artifacts include 30 quartz waste flakes and two fragments of quartz angular waste. The period of occupation is unknown. The subsurface condition of the site is unknown and would require a site examination to determine it.

Recorded Historic Sites.

Hillside Church Monument (HA-2). A stone monument marking the approximate location of the Hillside Church appears on an existing MHC site form. Recorded by E.K. Whitcomb of the Bolton Historical Society, the church may have been destroyed by widening of the road.

Sawmill Brook Mills (HA-7). A number of mills including the Morse Grist Mill, the Creampot Pond, the Forbush Lower Mill, the Upper Mill and mill dam, and Wilder Pond, are included in an existing site form covering a large area in which there are several sites and roads, and recorded by Anne Forbes in 1998. Site forms have been prepared for each individual site during this survey.

The Lancaster Railroad (HA-12). A section of the Lancaster Railroad passed through the Still River Survey Unit.

The Still River Shop (HA-22). The Still River Shop was shown on the historic map of 1870.

The Still River Road Comb Factory (HA-24). The Still River Road Comb Factory was shown on the historic map of 1831, and described by Whitcomb (1988:240).

The North School House (HA-28). The North School House on Still River Road was shown on the historic map of 1831.

The Lower Mill (HA-70). The Lower Mill was shown on the historic map of 1831, on a small pond known as the Acreampot. The mill may have been built as early as the mid-1700s. Benjamin Morse operated the mill until his death in 1844 (Whitcomb 1938:201,202; Whitcomb 1988:225,226). The mill is opposite 131 Forbush Mill Road (Lima 1998:12). This site consists of mill, dam, and access road ruins. The mill foundations are in good condition. It is part of MHC Historic Site HA-7, previously recorded, and MHC Form 938.

The Sampson Wilder/Upper Mill (HA-71). The Sampson Wilder/Upper Mill on Wilder Pond was shown on the historic maps of 1831, 1857, and 1870. It is part of MHC Historic Site HA-7, previously recorded, and MHC Forms 937 and 941. The mill is believed to have been built ca. 1830 by Sampson Wilder, and may have been used as a shingle, sash, and blind mill (Forbes 1998). The site is on Bolton conservation land.

The J. D. Hurlbutt Store (HA-73). The J. D. Hurlbutt Store was shown on the historic map of 1870.

The South School House on Still River Road (HA-74). The South School House on Still River Road was shown on the historic maps of 1857, 1870, and 1898, south of an earlier one.

The Haynes Brickyard (HA-75). The Haynes Brickyard on the Still River was referred to by Linda Engelmann (personal communication 2000).

The Wilder Road Cider Mill (HA-76). The Wilder Road Cider Mill was shown on the historic map of 1898.

The Green Road School (HA-77). The Green Road School was shown on the historic map of 1898.

The Barnard Saw Mill and Turning Lathe (HA-78). The Barnard Saw Mill and Turning Lathe was built on Sawmill Brook (then known as Billings Brook) by Joel and Joab Barnard in 1815. It mill operated until ca. 1831. This mill was upstream from the Sampson Wilder/Upper Mill (HA-71). The mill remains are not visible but a thorough site examination may reveal them.

A Goose House (HA-79). A Goose House was shown on AGoose & Fish Pond on the historic map of 1831. This was associated with Sampson Wilder's country estate and was built near Wilders Pond.

The Howard Brickyard (HA-80). The Howard Brickyard was referred to by Whitcomb (1988:13).

The West Bolton Meeting House (HA-87). The West Bolton Meeting House was shown on the historic maps of 1831 and 1857.

The West Cemetery (MHC 802). The West Cemetery, located approximately a mile and a half northwest of the town center on what is today Green Road, was first shown on the historic map of 1831. It is one of two cemeteries established in 1822 when Bolton's Old South Cemetery had reached its capacity. The land for the cemetery, consisting of 1 acre, was donated to the town by Thomas and Silas Welch. There are eleven graves of Revolutionary War veterans in the West Cemetery. This cemetery was still being used for burials in the late 1980s (Whitcomb 1988:146,147). It was previously recorded on MHC Form 802.

Archaeological Services Survey. During the reconnaissance at the Still River Survey Unit, a small pond with an apparent headrace and stone walls were viewed at the site of the Barnard Saw Mill and Turning Lathe (HA-78) shown on the historic map of 1831. The fields containing prehistoric sites 19-WR-351, 353, 356, and 544 were viewed from Still River Road.

Vaughn Hills Survey Unit

Boundaries. This survey unit is located in the north central section of Bolton (Figure 3). It is bordered on the west by Vaughn Hill Road and on the north by the town line with Harvard. The eastern boundary is drawn along Interstate 495. The southern boundary with the Bolton Center Survey Unit follows Golden Run Road, Harvard Road, the pipeline between Harvard and Nourse Roads, Nourse Road from the pipeline northwest to Green Road, and Green Road southwest to Vaughn Hill Road. This survey unit is depicted on the Hudson (1997) USGS 7.5 H 15-minute quadrangle, and on earlier 7.5-minute Hudson (1943, 1979) and Clinton topographic quadrangles.

Topography. The topography of the Vaughn Hills Survey Unit is hilly. Three major hills comprise most of the survey unit. The Vaughn Hills are really two peaks, 193 and 194 m (635 and 637 ft) in elevation, which make up all of the survey unit west of Green and Bare Hill Roads. Vaughn Hills descend to a low of 72 m (236 ft) along Still River Road, in the extreme northwest edge of the survey unit. The second major hill is the unnamed rise between Harvard and Green Roads, which reaches 195 m (642 ft). The third major hill lies north of Golden Run Road, and east of Harvard Road, and is the southern end of Bare Hill. This hill is highest just east of Harvard Road at the Harvard town line, where it reaches an elevation of approximately 172 m (565 ft).

Water Sources. The Vaughn Hills Survey Unit has a variety of small streams that drain the three large hills. An unnamed stream collects water from the west side of Vaughn Hills, and flows northwesterly into the Still River. The east side of Vaughn Hills is drained by an unnamed stream that flows south, wrapping around the hills and turning north into the Still River, and by Bowers Brook, which flows north into Bare Hill Pond in Harvard, eventually reaching the Nashua in Ayer. There are numerous unnamed streams that drain the unnamed hill in the center of the survey unit, some flowing south and then west to the Nashua, and others south and east toward Great Brook and the Assabet. The largest brook in the survey unit begins on the north side of the unnamed central hill, flowing southeast and collecting runoff from the south side of

Bare Hill, and continuing toward Great Brook. Another unnamed stream drains the east side of Bare Hill, flowing southeasterly through the northeast corner of the survey unit toward East Bolton.

Soils. Soils in this survey unit are not very favorable for the presence of Native American archaeological sites. There are small formations of well-drained Merrimack fine sandy loam and Hinckley sandy loam, mostly concentrated around Bowers Brook, with some small areas also at the eastern end of the survey unit, along Corn Road (Taylor and Hotz 1985). These landforms are favorable for settlement and agriculture. There are larger formations of well-drained Paxton fine sandy loam and moderately well-drained Woodbridge fine sandy loam located along the flat, low terraces, at the bases of the hills, as well as on flat upper terraces. These formations are concentrated on the north side of Vaughn Hills, the north and west sides of the unnamed central hill, the north side of Powder House Hill, and on the high, flat section of Bare Hill. The drainage beds of the streams in this survey unit are Whitman loam, Ridgebury fine sandy loam, Freetown muck, and Swansea muck, all of which are poorly drained and unfavorable for settlement or agriculture. Most of the hilltops and slopes in the survey unit are rocky and steep Chatfield-Hollis soils.

Recorded Native American Sites. The Vaughn Hills Survey Unit contains no previously recorded Native American sites.

Recorded Historic Sites.

The Fiddler=s Green Tavern (HA-18). The Fiddler=s Green Tavern was referred to by Whitcomb (1988:13).

Corn Road Dam (HA-72). The site is the Corn Road Dam referred to by Linda Engelmann, chair of the BHC (personal communication 2000). The dam is on the upper reaches of Great Brook on Corn Road at the Harvard town line.

The Houghton Garrison (HA-82). The Houghton Garrison, corner of Green/Bare Hills Road, was referred to by Whitcomb (1988:10).

The Vaughn Hill Road Foundations (HA-83). The Vaughn Hill Road Foundations were unidentified foundations recorded during the reconnaissance for this project.

The Green Road Barn (HA-84). The Green Road Barn was a foundation recorded during the reconnaissance for this project.

The West Bare Hill School House (HA-85). The West Bare Hill School House was shown on the historic maps of 1831, 1857, and 1870. It was previously recorded on Form MHC 117.

The Smallpox Cemetery (MHC 804). The Smallpox Cemetery was previously recorded on MHC Form 804. It is located close to where the bridge crosses Interstate 495, and contains the

graves of two smallpox victims from 1845. It was believed that moving the bodies of smallpox victims for burial would spread the disease, so smallpox victims were typically buried quickly in the vicinity of their own homes. The burial ground contains the bodies of John P. Hatch and his four-year-old daughter, both of whom died from smallpox and were buried in 1845. Today this smallpox burial ground is overgrown (Whitcomb 1988:148).

Archaeological Services Survey. During the reconnaissance at the Vaughn Hills Survey Unit, the Vaughn Hill Road Foundations (HA-83) were recorded. They consist of a cellar hole, lined with stone foundation walls, located on the north side of the road, with a larger enclosure or foundation in the pasture beyond. The Green Road Barn (HA-84), a foundation built of stone, was viewed next to an historic house. The Smallpox Cemetery (MHC 804) was viewed.

East Bolton Survey Unit

Boundaries. This survey unit is located in the northeast section of Bolton (Figure 3). It is bordered on the west by Interstate 495 and on the southwest by the Bolton Center Survey Unit, which follows the south side of Rattlesnake Hill to Meadow Road, and south along that road to Long Hill Road. The northern boundary is formed by the Harvard town line. The eastern boundary is formed by the town line with Stow. The southern boundary is drawn along an east-west line running from Long Hill Road over Long Hill to the Stow town line. This survey unit is depicted on the Hudson (1997) USGS 7.5 H 15-minute quadrangle, and on earlier 7.5-minute Hudson (1943, 1979) and topographic quadrangles.

The East Bolton Survey Unit includes the East Bolton historic landscape and a section of the Pan historic landscape detailed in the Preservation Plan for the Town of Bolton (Lima 1998).

Topography. The topography of the East Bolton Survey Unit is hilly, dominated by two primary peaks: Rattlesnake Hill, at 146 m (480 ft); and Long Hill. Rattlesnake Hill forms most of the western section of the survey unit, with a low area along the unnamed stream to its north, and the east side of the hill cut by Great Brook. Long Hill comprises most of the eastern part of the survey unit. The community center of East Bolton and Brockway Corner is in the low area northeast of Rattlesnake Hill and north of Long Hill, formed by the junction of Great Brook and the unnamed stream that flows north of Rattlesnake Hill. The highest point in the survey unit is on Long Hill, at 147 m (482 ft), while the lowest elevations are along Great Brook, at 71 m (233 ft).

Water Sources. The East Bolton Survey Unit has several sources of fresh water, all of which are part of the greater Assabet drainage. The largest is Great Brook, which flows in a northeasterly direction from Bolton Center, winding in between Rattlesnake and Long Hills, through East Bolton into Stow, where it meets Elizabeth Brook, and enters the Assabet River near the Stow-Maynard town line. Several unnamed streams drain the south and western sides of Rattlesnake Hill, flowing south into Great Brook at the Pan. An unnamed stream drains the north side of Rattlesnake Hill, flowing east from the Vaughn Hills Survey Unit, meeting Great Brook at the community center of East Bolton. Another unnamed stream drains the north side of Long

Hill, flowing north into East Bolton, and joining Great Brook. Finally, an unnamed stream drains the top and east side of Long Hill, flowing southeasterly into Stow.

Soils. Soils in this survey unit are somewhat favorable for the presence of Native American archaeological sites. The terraces along Great Brook, and the unnamed stream north of Rattlesnake Hill that are flat and well drained, and include small formations of Merrimack fine sandy loam, Hinckley sandy loam, Sudbury fine sandy loam, and Woodbridge fine sandy loam, all of which are favorable for settlement and agriculture (Taylor and Hotz 1985). These landforms include the central and northern parts of the survey unit. There are also moderately well drained soils on the terraces on and around Long Hill, comprised of Woodbridge fine sandy loam and Paxton fine sandy loam. Some smaller formations of Paxton and Woodbridge soils are also found on the north and west sides of Rattlesnake Hill. The drainage beds of Great Brook and the other streams in this survey unit are Freetown muck, Swansea muck, Scarboro mucky fine sandy loam, and Whitman loam, all of which are poorly drained and unfavorable for settlement or agriculture. The hilltops and slopes in the survey unit are rocky and steep Chatfield-Hollis soils.

Recorded Native American Sites. The East Bolton Survey Unit contains no previously recorded Native American sites.

Recorded Historic Sites.

Osborne Hall (HA-17). Osborne Hall, a brick building, was shown on the historic map of 1898.

The East Bolton Potash Works (HA-30). The East Bolton Potash Works was shown on the historic map of 1794. This site is mapped near the eastern town boundary in the vicinity of Annie Moore Road (Whitcomb 1988:237).

The Whitcomb (Great Brook) Fulling Mill (HA-32). The Whitcomb (Great Brook) Fulling Mill, used to process woolen textiles, was shown on the historic map of 1794. It was referred to by Whitcomb (1988:231).

The East Bolton Lime House (HA-33). The East Bolton Lime House was shown on the historic maps of 1794 and 1831. It was referred to by Whitcomb (1988:241).

The Whitcomb Lime Kiln and Quarry (HA-54). The Whitcomb Lime Kiln and Quarry was referred to by Whitcomb (1988:241,394) and was previously recorded on MHC Forms 927 and 928.

The Bolton District No. 4/East School House (HA-55). The Bolton District No. 4/East School House was shown on the historic maps of 1831, 1857, 1870, and 1898. It was previously recorded on MHC Form 118.

The Cigar Manufactory (HA-68). The Cigar Manufactory was shown on the historic map of 1870, and was referred to by Whitcomb (1988:222).

The David and Abel Whitcomb Grist Mill and Saw Mill (HA-69). The David and Abel Whitcomb Grist Mill and Saw Mill was built in the eighteenth century by Abel Whitcomb (Lima 1998:12-31). The mill was located on a tributary of Great Brook north of 496 Sugar Road.

An Ochre Mine (HA-81). A nineteenth-century Ochre Mine was located on the north side of Long Hill. The exact location is unknown (Whitcomb 1988). A walkover of the hill may locate the site.

The Moses H. Mentzer Inn and Barn (HA-88). The Moses H. Mentzer Inn and Barn have been destroyed. The inn burned in the 1920s and the barn was destroyed in the 1938 hurricane (Linda Engelmann, personal communication 2000; Beverly Mentzer, personal communication 2000). The inn foundation is on the north side of the road and has been filled in. The barn foundation is exposed.

Archaeological Services Survey. During the reconnaissance, the early industrial complex on Great Brook was visited. These sites include the pits of the Whitcomb Lime Kiln and Quarry (HA-54), and the imputed site of the East Bolton Lime House (HA-33).

Ballville Survey Unit

Boundaries. This survey unit is located in the southwestern section of Bolton (Figure 3). It is bordered on the west by the town line with Lancaster. The northern edge of the survey unit is drawn along Wilder Road and Old Bay Road from the Lancaster line to Wataquodock Hill Road. The eastern edge of the survey unit follows Wataquodock Hill Road south from Old Bay Road to West Berlin Road, and south along that road to the Berlin line. The south edge of the Ballville Survey Unit is formed by the Berlin town line. This survey unit is depicted on the Hudson (1997) USGS 7.5 H 15-minute quadrangle, and on the earlier 7.5-minute Clinton (1943, 1979) topographic quadrangles.

The Ballville Survey Unit includes sections of the Nashaway historic landscape and the Wataquodock Hill Vistas and Farms historic landscape detailed in the Preservation Plan for the Town of Bolton (Lima 1998).

Topography. The topography of the Ballville Survey Unit is mostly hilly. This survey unit includes the western half of Wataquodock Hill, including its peak at 201 m (660 ft), and the western terraces of the hill slope. In the north central part of the survey unit is a smaller hill reaching an elevation of 177 m (577 ft). The western part of the survey unit includes a flat terrace at 115 m (377 ft), now occupied by the International Golf Club, and a slightly higher flat hill at 136 m (448 ft), with one peak reaching 153 m (502 ft). The lowest topography in the survey unit lies along the Runaway Brook at 96 m (315 ft).

Water Sources. The Ballville Survey Unit contains fresh water from Runaway Brook, and from two arms of North Brook. Runaway Brook drains the western part of the survey unit, including the flat terrace and 136 m (448 ft) flat hill, to the west into the Nashua River in Lancaster. North Brook flows south into Berlin, and joins the Assabet in South Berlin. The eastern arm of North Brook drains Wataquadock Hill, and includes Welch Pond. The western arm of North Brook forms the western base of Wataquadock Hill, draining south from Old Bay Road, and including several millponds, the largest of which is in the Fyfeshire Conservation Area.

Soils. Soils in this survey unit are mostly favorable for the presence of Native American archaeological sites. The flat terrace and 136 m (448 ft) flat hill consist of sizable formations of Merrimack fine sandy loam, Windsor loamy fine sand, and Paxton fine sandy loam, all of which are favorable for settlement and agriculture (Taylor and Hotz 1985). The flat, well-drained terrace is cut by Runaway Brook, and is bordered on the east by an arm of North Brook. A few small areas of this terrace have been disturbed by gravel operations and development. The western slopes of Wataquadock Hill are rocky and steep Chatfield-Hollis soils. The drainage beds of Runaway and North Brooks are classified as Freetown muck, Scarboro mucky fine sandy loam, Raynham silt loam, Whitman loam, and Walpole fine sandy loam, all of which are poorly drained and unfavorable for settlement or agriculture.

Recorded Native American Sites. Four Native American sites have been recorded in the Ballville Survey Unit.

The International Golf Locus 1 Site (19-WR-666). The soil types evident at the site are Hinckley and Windsor (all glacial outwash soils that are well drained) with slopes ranging from 0 to 15 percent. This soil is often associated with prehistoric sites in other parts of the state. The elevation of the site is 90 m (285 ft) above sea level in a wooded residential setting. The site was discovered during an archaeological survey conducted by the Public Archaeology Laboratory, Inc. prior to construction of the golf course (Rainey and Mair 1999). In all, 93 artifacts were recovered from the site. They include one quartz Squibnocket point (4,000 to 5,400 years ago), 83 quartz flakes, two argillite flakes, and seven fragments of schist. The site was occupied on several occasions by prehistoric peoples during the Late Archaic period, a time span between 5,000 and 3,000 years ago. The subsurface condition of the site is unknown and would require a site examination to determine it.

The International Golf Locus 2 Site (19-WR-667). The soil types evident at the site are Hinckley fine sandy loam (a glacial outwash soil that is well drained) with slopes ranging from 0 to 5 percent. This soil is often associated with prehistoric sites throughout the state. The elevation of the site is 105 m (314 ft) above sea level in a wooded setting. The site was discovered during an archaeological survey conducted by the Public Archaeology Laboratory, Inc. prior to construction of the golf course (Rainey and Mair 1999). In all, five artifacts were recovered from the site. They include one quartz Small-Stemmed point (2,800 to 5,075 years ago) and four quartz flakes. The site probably witnessed a single occupation

by prehistoric people during the Late Archaic period, sometime during a time span between 5,000 and 3,000 years ago. The subsurface condition of the site is unknown and would require a site examination to determine it.

The International Golf Locus 3 Site (19-WR-668). The soil type at the site is Windsor fine sandy loam (a glacial outwash soil that is well drained) with slopes ranging from 0 to 5 percent. This soil is often associated with prehistoric sites throughout the state. The elevation of the site is 114 m (374 ft) above sea level in a wooded setting. The site was discovered during an archaeological survey conducted by the Public Archaeology Laboratory, Inc. prior to construction of the golf course (Rainey and Mair 1999). One flake of an unidentified lithic material was recovered from the site. This site is considered a findspot and is not archaeologically significant.

The Schultz Site (19-WR-709). The soil type is Agawam and Hinckley fine sandy loam (both are well-drained glacial outwash deposits) with slopes ranging from 0 to 3 percent. Both soils often are associated with prehistoric sites throughout the state. The elevation of the site is 120 m (360 ft) above sea level in an open rural area. Reported artifacts include Brewerton Notched (4,079 to 4,900 years ago), Squibnocket Triangles (4,000 to 5,400 years ago), and Small-Stemmed points (2,800 to 5,075 years ago), Jack=s Reef Pentagonal (1,200 years ago, a groundstone axe head, a hammerstone and a ground stone celt. The artifacts reported from this site are in the collection of Herman Schultz of Bolton. The site was occupied on several occasions by prehistoric peoples during the Late Archaic and Woodland periods, a time span between 5,000 and 1,200 years ago. The subsurface condition of the site is unknown and would require a site examination to determine it. Schultz mentions that this is also the site of a mill/block house.

Recorded Historic Sites.

The Lancaster Railroad (HA-12). A section of the Lancaster Railroad ran through the Ballville Survey Unit.

The Wataquadock Hill School House (HA-27). The Wataquadock Hill School House was shown on the historic map of 1831.

The Ballville Store (HA-42). The Ballville Store was shown on the historic map of 1870.

The Ballville Comb and Shoe Shop (HA-43). The Ballville Comb and Shoe Shop, featuring a Dam, was shown on the historic maps of 1857 and 1870.

The Wataquadock Hill Observatory (HA-44). The Wataquadock Hill Observatory was shown on the historic map of 1870.

The Ballville Road School (HA-45). The Ballville Road School was shown the historic maps of 1870 and 1898.

The Fyfe Button Factory Complex (HA-46). The Fyfe Button Factory Complex, featuring a Dam, was referred to by Linda Engelmann (personal communication 2000), and was previously recorded on MHC Form 957 (which includes 958-962). Located on town conservation land, the site consists of the ruins of a dam. The site is in good condition.

The Ballville Railroad Station (HA-47). The Ballville Railroad Station was shown in the Boundaries Book of 1908, which is on file at the Bolton Public Library.

The Bolton Airport (HA-48). The Bolton Airport was a single-runway strip that was in operation between the 1930s and the 1950s.

The Dam and Pond at Haynes-Wheeler Farm (HA-49). The Dam and Pond at Haynes-Wheeler Farm was previously recorded on MHC Forms 954-955. The dam was probably associated with a comb shop and slaughterhouse. The dam and pond still exist.

Archaeological Services Survey. During the reconnaissance of the Ballville Survey Unit, the Fyfe Button Factory Dam complex (HA-46), located on a stream that flows under Wataquodock Hill Road, was visited. A series of stone dams and small millponds are located there. Another dam, which was likely used to power manufacturing devices, was viewed at the site of the Ballville Comb and Shoe Shop (HA-43). The sites of the nineteenth-century Ballville Store (HA-42) and the Ballville Railroad Station (HA-47) were also visited.

Fryville Survey Unit

Boundaries. This survey unit is located in the south central section of Bolton (Figure 3). It is bordered on the west by the Ballville Survey Unit, which is drawn along West Berlin Road north to Wataquodock Hill Road. The northern edge of the survey unit is drawn along a line from the intersection of Old Bay Road and Wataquodock Hill Road east to the intersection of South Bolton Road and Berlin Road, and then southeast along South Bolton Road to Interstate 495. The eastern edge of the survey unit follows Interstate 495. The south edge of the Fryville Survey Unit is formed by the Berlin town line. This survey unit is depicted on the Hudson (1997) USGS 7.5 H 15-minute quadrangle, and on earlier 7.5-minute Hudson (1943, 1979), and Clinton (1943, 1979) topographic quadrangles.

The Fryville Survey Unit includes the Quaker historic landscape detailed in the Preservation Plan for the Town of Bolton (Lima 1998).

Quaker History. Beginning in the eighteenth century, there was a considerable presence of Quakers in the Fryville section of Bolton. Several Quaker families moved to Bolton in the mid-eighteenth century. Between 1762 and 1789 a meetinghouse was constructed on the land of John Fry (Whitcomb 1988:122). The meetinghouse was removed to Sturbridge Village in the twentieth century. The cemetery remains. For well over a century, many of the Quaker families lived within a mile of the center of what is known today as Fryville. While dedicated to their

religious pursuits, the Quakers were also dedicated to excellence in education and production. The Fry Quaker School was noted in the nineteenth century as a model for good-quality education. The school was open to Quakers and non-Quakers (Whitcomb 1988:124).

Many of the Quaker families ran mills and commercial establishments. There were several industrial sites in Fryville in the eighteenth and nineteenth centuries. Lewis Fry and Joseph Holder produced high quality shoes with leather tanned in Bolton. The industry developed into the well known AFrye Boots® line of the twentieth century. The Fry card and machine shop produced textile cards and curry combs. Amos Evans produced furniture in a building on Berlin Road (Whitcomb 1988:122-124; Lima 1998:84).

By the 1870s, many of the houses in the vicinity of the village of Fryville retained the names of Quaker families. The Quaker families of Fry, Powers, Wheeler, Babcock, Kimmers, Osgood, Watson, Houghton, and Evans are mapped on the Beers Atlas of 1870 (Figure 9), all within a mile or so of the village.

Topography. The topography of the Fryville Survey Unit is primarily divided between hilly areas and swampy areas. This survey unit includes the eastern half of Wataquadock Hill, and the eastern terraces of the hill slope, which range from 189 m (620 ft) to 120 m (394 ft). This includes the western half of the survey unit. The eastern part of the Fryville Survey Unit is comprised of numerous streams and brooks that drain Wataquadock Hill to the east into Mill Brook, east of Interstate 495. This includes the northern section of Hog Swamp, which lies at 106 m (350 ft).

Water Sources. The Fryville Survey Unit contains abundant freshwater associated with the upper sections of the Mill Brook drainage. Mill Brook flows east into Danforth Brook, which flows into Hudson into the Assabet River. The southern part of Hog Swamp drains to the south into Hog Brook, which also enters the Assabet in Hudson.

Soils. Soils in this survey unit are not very favorable for the presence of Native American archaeological sites. However, there are several small terraces and low hilltops bordering the edges of Hog Swamp and the arms of Mill Brook that are comprised of well-drained soils. These include small formations of Merrimack fine sandy loam, Hinckley sandy loam, Windsor loamy fine sand, and Paxton fine sandy loam, all of which are favorable for settlement and agriculture (Taylor and Hotz 1985). These landforms lie scattered across the eastern part of the survey unit. The drainage beds of Hog Swamp are Freetown muck, Swansea muck, and Scarboro mucky fine sandy loam, all of which are poorly drained and unfavorable for settlement or agriculture. The eastern slopes of Wataquadock Hill are rocky and steep Chatfield-Hollis soils, except for a few flat terraces, which include formations of Paxton fine sandy loam.

Recorded Native American Sites. No Native American sites have been recorded in the Fryville Survey Unit.

Recorded Historic Sites.

The First Quaker Meeting House (HA-1). The First Quaker Meeting House was previously recorded as MHC Historic Site HA-1.

The Fry Academy (HA-3). The Fry Academy was previously recorded as MHC Historic Site HA-3, and was referred to by Whitcomb (1988:124).

The Old Bay Road Comb Factory (HA-23). The Old Bay Road Comb Factory was shown on the historic map of 1831.

The Fryville (Quakers) District No. 8 School House (HA-26). The Fryville (Quakers) District No. 8 School House was shown on the historic map of 1831. It was referred to by Whitcomb (1988:124).

The Town Farm (HA-29). The Town Farm was shown on the historic maps of 1831 and 1870. All of the buildings associated with the farm have been demolished but foundations are still in existence.

The Second Quaker Meeting House (HA-31). The Second Quaker Meeting House was shown on the historic maps of 1794, 1831, 1857, and 1898. It was referred to by Whitcomb (1988:124). The structure was moved to Old Sturbridge Village in 1954.

The Farm Road School (HA-56). The Farm Road School was shown on the historic map of 1898.

The Berlin Road Tan House (HA-57). The Berlin Road Tan House was shown on the historic map of 1831. It was referred to by Whitcomb (1988:229).

The Sawyer Road Extension (HA-58). The Sawyer Road Extension was a section of roadway shown on the historic maps of 1831, 1857 and 1870.

The Quaker Lane Shoe Shop (HA-59). The Quaker Lane Shoe Shop was shown on the historic map of 1857.

The John Moore Garrison (HA-60). The John Moore Garrison, 183 Berlin Road, was previously recorded as MHC Form 940, and was referred to by Whitcomb (1988:9). John Moore was commander of the garrison. He and his brother Jonathan lived in the house. The building was razed between 1925 and 1930. A new residence has been built at the site and the site is probably destroyed.

The Jonathan Fry Card and Comb Shop (HA-61). The Jonathan Fry Card and Comb Shop was referred to by Whitcomb (1988:244).

The Berlin Road Barn (HA-62). The Berlin Road Barn was a foundation identified by the reconnaissance for this project.

The Quaker Cemetery (MHC 803). The Quaker Cemetery was shown on the historic map of 1870, was previously recorded as MHC Form 803. It was established in 1844 when the land for it was donated by James N. Fry and his wife Ruth. This cemetery is six-tenths of an acre in size and is surrounded by a stone wall. Set into the wall facing the road is a large granite slab engraved A Society of Friends Burial Ground, @ placed there in 1960 by Frederick B. Evans, whose grandparents were buried there (Whitcomb 1988:147).

The Old Fry Cemetery (MHC 805). The Old Fry Cemetery was previously recorded as MHC Form 805, and is shown in the Massachusetts Cultural Resource Information System (MACRIS) maintained by the Massachusetts Historical Commission. This was the first burial ground established by a small community of Quakers who settled in the south part of Bolton. This burial ground was located close to the Quakers= first meetinghouse (HA-1). Exactly when this burial ground was established is unclear, but in 1799 John Fry and his wife Rachel deeded to the Quakers a small piece of land A where the Burying Ground of the People called Quakers now is. @ In 1988, Whitcomb surmised that the burial ground had already been in use for 25 to 30 years at that time. It continued to be used as a Quaker cemetery until 1844, when a new cemetery (MHC 803) was established farther north on Berlin Road (Whitcomb 1988:147).

Archaeological Services Survey. During the reconnaissance of the Fryville Survey Unit, the imputed site of the First Quaker Meeting House (HA-1) was viewed. No surface remnants were visible on the high ground within the meadow. The site of the Second Quaker Meeting House (HA-31) also was visited. The structure was moved to Old Sturbridge Village in 1954. The site consists of a rectangular lawn surrounded by a low stone fence. The site of the Town Farm (HA-29) consists of an extensive meadow area with scrub vegetation, where some modern debris is scattered. At the imputed location of the Old Bay Road Comb Factory, there is a meadow used for grazing cattle, but no indication of historic resources. A stone-lined sluice was viewed on the north side of Rocky Dundee Road, at the site of the Berlin Road Tan House (HA-57). A house, which may contain historic elements, is located on top of the knoll where the John Moore Garrison (HA-60) is believed to have been located. The stone foundations of several outbuildings are also visible there. The foundation of the Berlin Road Barn (HA-62), built of stone, was viewed next to an historic house. No evidence of the Jonathan Fry Card and Comb Shop (HA-61) was visible adjacent to Sawyer Hill Road.

Hudson Road Survey Unit

Boundaries. This survey unit is located in the southeast section of Bolton (Figure 3). It is bordered on the west by Interstate 495 and the Fryville and Bolton Center Survey Units. The northern boundary is drawn along an east-west line running from Interstate 495 between Little and West Ponds, and over Long Hill to the Stow town line. The eastern boundary is formed by the Stow town line. The southern boundary is formed by the Hudson town line. This survey unit is depicted on the Hudson (1997) USGS 7.5 H 15-minute quadrangle, and on earlier 7.5-minute Hudson (1943, 1979) and Clinton topographic quadrangles.

Topography. The topography of the Hudson Road Survey Unit is hilly, interrupted by several brooks and streams. This survey unit includes several hilltops over 140 m (460 ft), including Pine Hill 155 m (508 ft), Spectacle Hill 145 m (476 ft), Barretts Hill 144 m (474 ft), the southern end of Long Hill 147 m (482 ft) and also the slightly lower Stratton Hill 121 m (398 ft). All of these hills are adjacent to lower, unnamed hills that generally range between 105 and 135 m (345 to 443 ft). The western edge of the survey unit includes low, wet areas that are part of the greater Hog Swamp and Sunk Meadow wetlands. Pine Hill is the highest elevation in the survey unit, while the lowest elevations are along the unnamed streams that flow southerly from the east and west sides of Barretts Hill into Hudson, at 77 m (253 ft).

Water Sources. The Hudson Road Survey Unit contains abundant freshwater associated with tributaries of the Assabet River. The largest of these is Danforth Brook, and its tributary Mill Brook, which flow from the west and southwest in a northeasterly direction around Pine Hill, and then turn southeasterly flowing into Hudson. Little Pond is also part of this drainage. Two unnamed streams drain Barretts Hill, flowing in a southerly direction to the hill's east and west into Hudson. The final source of fresh water in the survey unit is the unnamed brook that flows down the east side of Long Hill into Stow.

Soils. Soils in this survey unit are somewhat favorable for the presence of Native American archaeological sites. There are areas along Mill and Danforth Brooks that are flat and well drained, and include small formations of Merrimack fine sandy loam, Hinckley sandy loam, and Woodbridge fine sandy loam, all of which are favorable for settlement and agriculture (Taylor and Hotz 1985). These landforms are confined to the western part of the survey unit. There are also well-drained soils on lower terraces around the bases of the hills, particularly along Danforth Brook, to the west and northwest of Barretts Hill, and on and around the unnamed hill east of Little Pond, comprised of Woodbridge fine sandy loam, and Paxton fine sandy loam. The drainage beds of Mill and Danforth Brook are Freetown muck, Swansea muck, and Scarboro mucky fine sandy loam, all of which are poorly drained and unfavorable for settlement or agriculture. The hilltops and slopes in the survey unit are rocky and steep Chatfield-Hollis soils.

Recorded Native American Sites. No Native American sites have been recorded in the Hudson Road Survey Unit.

Recorded Historic Sites.

The Spectacle Hill Stone Piles (HA-6). The Spectacle Hill Stone Piles were referred to by Linda Engelmann (personal communication 2000), and were previously recorded as MHC Historic Site HA-6 and MHC Form 934.

The Lancaster Railroad (HA-12). A section of the Lancaster Railroad passed through the Hudson Road Survey Unit.

The N. A. Newton Store/House (HA-63). The N. A. Newton Store/House was shown on the historic map of 1857 (Whitcomb 1988:328).

The Hudson Ice Company (HA-64). The Hudson Ice Company was shown on the historic map of 1898, and was referred to by Whitcomb (1988:389).

The South Bolton Railroad Station (HA-65). The South Bolton Railroad Station was referred to by Whitcomb (1988:68).

The Mill Brook/Thomas Sawyer Saw Mill (HA-66). The Mill Brook Saw Mill, which was wooden in 1898, and featured a Bridge, was shown on the historic maps of 1794, 1831, 1857, and 1898. It was previously recorded as MHC Forms 932-933. The site is located on what is known today as Century Mill Pond (Whitcomb 1988:222). The mill was built by Thomas Sawyer, possibly as early as 1700 (Forbes 1998; Form 931). The 1739 will of Joseph Sawyer refers to Aye saw mill and ye corn mill, @ which he left to his son, Thomas. The Sawyer family continued to operate this sawmill and gristmill (HA-67) until the early nineteenth century, when the mills were willed to Captain Amory Pollard. His son, Amory Pollard, Jr. continued to operate the mills until 1865 when they were sold to Freeman Walcott. In 1881, the mills were hit by lightning and the sawmill (constructed of wood) burned to the ground, while the gristmill (constructed of brick) survived. The sawmill was apparently rebuilt soon after the fire. The mills changed hands a few more times in the closing years of the nineteenth century and the early years of the twentieth century. By 1916, when Dr. George Bacon owned the mills, the sawmill and gristmill were being operated only on an experimental basis, and for a very short time. The mills and farm property associated with them were sold a few more times in the twentieth century and both had deteriorated to ruins by the 1950s (Whitcomb 1938:199, 200; Whitcomb 1988:222; MHC Form 931). The dam for this mill may have provided power for the gristmill downstream (HA-67).

The Mill Brook Grist Mill (HA-67). The Mill Brook Grist Mill, which was brick in 1898, was shown on the historic maps of 1794, 1831, 1857, and 1898. It was previously recorded as MHC Form 931. The mill probably was operated by Thomas Sawyer, and may have been constructed as early as 1700 (Forbes 1998; Form 931; Whitcomb 1988:222). The mill and other structures associated with it were an industrial complex active until 1916. The complex was known over the years as Pollard=s Mills, Walcott=s Mills, and Century Mills. The complex also had a cider mill around the turn of the twentieth century. The wheel pit and portions of the millrace are evident but not in good condition.

Archaeological Services Survey. During the reconnaissance, the site of the Hudson Ice Company (HA-64) was visited on the northern shores of Little Pond. Although the facilities were quite substantial in the late nineteenth century, no evidence for them is readily apparent.

PROTECTION OF ARCHAEOLOGICAL RESOURCES IN MASSACHUSETTS

Several towns and commissions in Massachusetts review potential impacts to archaeological and historical resources. In addition to the procedures established by the towns and municipalities, there exist federal, state, and regional protections for archaeological resources. For example, any undertaking that is reviewed under Section 106 of the National Historic Preservation Act, the Massachusetts Environmental Policy Act, or Massachusetts burial legislation could be required to conduct an archaeological survey. In most cases, the local historical commission would be contacted for review, and copies of reports can be requested by the local commissions. The following section presents a discussion of several towns that have archaeological legislation or personnel, the manner in which reviews are triggered, and the procedures that are followed for cultural resources. The discussion is provided to give the Bolton Historical Commission models upon which to base an appropriate system of archaeological site protection.

Aquinnah

In 2000, by-laws to protect cultural resources were established by the town of Aquinnah (formerly Gay Head) on Martha's Vineyard. As a part of the establishment of a District of Critical Planning Concern (or DCPC), the town instituted a by-law that requires the Planning Board Plan Review Committee to determine what steps must be taken to allocate, identify and evaluate any archaeological and historical resources that may be significant (Herbster and Cherau 2000). If it is determined that a significant site may be impacted by a proposed project, the project proponent must fund an archaeological survey that would be conducted by a professional consultant. The process is similar to that followed by the Massachusetts Historical Commission. If sites are located during the survey that may be significant, subsequent archaeological surveys may be funded and conducted that will determine the significance of the site, and to mitigate impacts to it. The Review Committee consults with the Aquinnah Tribal Historic Preservation Officer, the MHC, and other appropriate agencies.

Barnstable

Archaeological resources are protected in Barnstable through the Conservation Commission. Under town by-laws the Commission has the authority to require archaeological surveys where proposed work within resource areas may have an impact on archaeological sites. The Conservation Commission works with the Historical Commission to determine which projects are likely to impact sites. The Historical Commission scans the Conservation Commission agenda in advance. If impacts are determined, the Conservation Commission is notified and it takes over the review.

In recent years the frequency of archaeological surveys has been reduced because of a regulation that archaeological resources must be in the resource area and must be listed in the state inventory or other lists. The resource area is defined as a surface water body, vegetated wetland or un-vegetated wetland, any land under said waters, and any land subject to flooding or inundation by ground water, surface water, tidal action, or coastal storm flowage (such as a

coastal bank), but not the 100-ft upland buffer. Unfortunately, the 100-ft buffer is the area most likely to contain prehistoric or historic archaeological sites. Unless the wetland resource is artificial (for example, a formerly dry area dammed by a railroad or highway), the wetland area itself has a low potential to contain sites. If sites did exist in these areas, the cost for their survey and recovery would be high. Another drawback with this system is that only those areas within wetlands and streams are protected. There are many other areas in the town that contain important archaeological resources that are not covered under the Conservation Commission's jurisdiction.

The issue of protection only within the resource area is the result of the unfortunate wording of the by-law definitions. The intent is to protect areas with historical values. The statement is as follows:

Historical Values: The importance of wetlands and adjoining land areas as sites often used for prehistoric and historic occupation, subsistence, industry, trade, agriculture, burial and other cultural purposes. Resource areas which are known to contain sites of historic or archaeological resources (as being listed on the State Register of Historic Places, the Inventory of Historic and Archaeological Assets of the Commonwealth, and/or the Barnstable Historical Commission's Historic Properties Inventory) are deemed to have historic value. Activities in or within 100 feet of resource areas shall not have a significant effect on historical values (Town of Barnstable: Special Conditions of Approval).

When sites are found within a resource area, the Conservation Commission recommends an archaeological survey according to the three-phase approach defined in the state permit regulations. The Conservation Commission then confers with the Massachusetts Historical Commission, and includes the requirements in the Order of Conditions of the wetland permit.

The contact person for the Barnstable Conservation Commission is Robb Gatewood, Conservation Department (508-790-6245).

Brewster

Under town regulations new construction is reviewed by a development Plan Review Committee, which coordinates the review of substantial development proposals (Brewster Code, Development Plan Review, Chapter 83). The purpose of the committee is to facilitate communication among several regulatory boards and committees. The committee is made up of the Building Commissioner and one member from each of the various town commissions including the Historical Commission. Projects that trigger a review are those that: 1) propose construction other than single-family or two-family homes and include a new principal building; 2) involve an increase in lot coverage by more than 800 square feet through construction of a new accessory building, or increase coverage of the lot by 10 percent or more; 3) involve substantial alteration of a parking facility having ten or more spaces; 4) require removal of vegetation from more than 10,000 square feet; or 5) involve any subdivision of land into two or more lots.

The archaeological clauses make it clear that the purpose is to avoid damage to the historic or archaeological value of sites. The clause states that project proponents may be required to

provide documentation concerning cultural resources within their area of development to the Massachusetts Historical Commission. The clause reads as follows:

Historic and Archaeologic Resources. Location and design shall not cause avoidable damage or impairment of the historic or archaeologic value of buildings or resources. Applicants may be required to submit documentation from the Massachusetts Historical Commission that the site either contains no such buildings or resources or that all feasible efforts to avoid, minimize or compensate for any potential damage or impairment have been made (Amended 5-1-1995 ATM, Art. 17, Section 83-9).

The contact person for the Town of Brewster is Jillian Douglass, Chief Procurement Officer=s Designee (508-896-3701).

Chilmark

The town of Chilmark completed a community-wide archaeological reconnaissance survey in 1998, conducted by the University of Massachusetts Archaeological Services. It was recommended that in the course of its duties, the Chilmark Planning Board flag sites that require review by the Chilmark Historical Commission. The key to the system is the use of two archaeological sensitivity maps (one for historic sites and the other for prehistoric) that were produced by the survey. The maps indicate areas of archaeological concern. The prehistoric survey map was made on the basis of the location of previously recorded sites, and a predictive model based on forest change, landform, and potential subsistence resources. Should a construction project be located within an area of moderate to high potential to contain sites, the Planning Board would send the project to the Historical Commission for review. The historic sensitivity map was based on distance to roads, streams (for hydropower industries), agriculturally suitable soils, population and commercial centers, and areas otherwise suitable for historic industry and commerce.

An issue that is presently being considered concerns thresholds established to trigger the review process. It was recommended that Chilmark use their own version of the process developed by the regional Martha=s Vineyard Commission, in which projects of specific sizes and impact trigger historical review (see below). It was recommended that review not be redundant with the review of the MVC or other review processes (such as Historic District Commission, Massachusetts Historical Commission, or other state and federal agencies). At this time, the historical commission is considering implementation.

The contact person for the Chilmark Historical Commission is Harriette Ottesen.

Falmouth

In 1995 and 1996, a town-wide archaeological reconnaissance survey was conducted for the town of Falmouth, by Archaeological Services. The project was co-funded by the Falmouth Historical Commission and the Massachusetts Historical Commission. It was recommended that the Falmouth Historical Commission (FHC) implement a program with the purpose of archaeological site protection, and adopt a by-law allowing the review of project plans to

determine impacts to archaeological sites. It was further recommended that the town use models such as used by the regional Martha=s Vineyard and Cape Cod Commissions, that review projects that meet certain criteria or thresholds and then be referred to the Massachusetts Historical Commission. The program that was recommended involves the establishment of town-sanctioned regulations spelling out the FHC=s responsibility and jurisdiction to review certain construction projects in advance with the intent of minimizing or avoiding adverse impacts to archaeological resources. In the proposed program, the legislation would clearly address the responsibility of key town boards and departments that would notify the Commission in advance of construction and the actions that the Commission would be authorized to take. It was urged that the Commission be allowed to review any town-sponsored, private, or commercial construction of a pre-determined size and nature, and that as early as possible the FHC and cooperative departments identify review thresholds. In the Falmouth program, the Commission would determine if the area of proposed construction is within a town archaeological-historical sensitivity map. If the project area is located within an area of concern, the Commission would be able to review the project area and determine whether or not the area requires a professional survey. If a survey appeared to be necessary, the Commission would solicit the advice of the Massachusetts Historical Commission.

To-date this program has not been implemented. The contact for the Falmouth Historical Commission is Anne Sears (508-548-7611).

Marion

The town of Marion was the subject of a community-wide archaeological reconnaissance survey conducted by PAL (Binzen et al. 1998). This project also was conducted as a Survey and Planning Grant. The project was co-sponsored by the Sippican Historical Society because a historical commission does not exist in the town. Matching funds were provided by the Massachusetts Historical Commission. The town was provided with a report covering the archaeological potential of the town, as well as several maps showing high, moderate, and low archaeological potential. Maps were divided by prehistory, history, and topographic zones. It was recommended that the maps be used as planning documents to assess the archaeological potential of construction projects in order to avoid destruction of important archaeological sites. It was recommended that the town consider a town by-law that the Planning Board could use to request that development in a high potential areas require an archaeological survey. The Planning Board would be the sole review organization for the town.

The contact person for the project was Judith Rosbe of the Sippican Historical Society.

Medfield

The town of Medfield has a formal archaeological committee that functions within the Medfield Historical Commission. Through an established process, notice of building permits and other reviewed projects are sent to the various review committees of the town, including the Medfield Archaeological Committee. The committee reviews projects that may impact archaeological sites and refers them to the Massachusetts Historical Commission for comment. At the Town Meeting of April 1995, the Archaeological Committee was established and charged

with producing a site sensitivity map. The committee is allowed to review development projects that fall within the mapped potential areas. If development occurs outside a sensitive area, there is no review. If proposed projects are likely to impact archaeological resources, the Archaeological Committee can establish an order of conditions governing the steps to be taken to protect them. The Committee can require that the project proponent conduct an archaeological survey prior to construction; there is no size threshold that triggers a survey. In one recent case, a private developer was asked to conduct an intensive (locational) archaeological survey. The Massachusetts Historical Commission was asked to provide a review of the archaeological scope of work. When a potentially significant site was found on the property, a site examination was recommended. The town opted to provide the funding for the second phase of archaeological survey. Thus far, if a private landowner is conducting a small-scale project, the Commission persuades the owner to watch for archaeological materials and, if necessary, dig test pits while the construction is ongoing. Members of the Archaeology Committee visit the site prior to construction to show the owner how to observe.

There is no specific legislation in the town relating to archaeology. The jurisdiction of the committee was approved in Town Meeting, but as a part of the Medfield Historical Commission. The Archaeology Committee functions within the Historical Commission and comes under the legislation governing the Commission. The Committee writes its own internal regulations. In 1996-1997, the town of Medfield provided matching funds for a Survey and Planning Grant that was awarded to the Public Archaeology Laboratory, Inc. The purpose of the project was to formalize the sensitivity map and provide guidance in managing the town's cultural resources.

The Archaeological Committee conducts projects of archaeological interest. Presently the Committee is planning to conduct some limited testing on geological features that are believed to have archaeological potential.

In 1996-1997, the Public Archaeology Laboratory conducted a community-wide reconnaissance study for a Planning and Review project in Medfield under contract with the town. Four archaeologically sensitive areas were identified and put under an Archaeological Protection District. A Ademolition delay@ by-law was adopted by the town to protect archaeological sites within the district (Ritchie 1997).

The contact persons for the Medfield Historical Commission are Charlotte Reineman (508-359-6871) and John Thompson (617-769-7600).

Wayland

The town of Wayland has an informal system for avoiding damage to archaeological sites when threatened by development. At present there are no formal town by-laws or other regulations concerning archaeological resources. If construction in the vicinity of an archaeological site is reported, the Wayland Historical Commission will review the project. If the project is a small private development, the Historical Commission may monitor construction. If the site is a larger development, the Commission will seek the advice of the Massachusetts Historical Commission. The Wayland Commission does not prescribe archaeological surveys on its own.

Since 1983, the Wayland Historical Commission has been conducting excavations at the Sand Hill site, a prehistoric site within a town-owned gravel pit. The Historical Commission is

provided a modest budget by the town to purchase equipment and determine radiocarbon dates. Space for curation of artifacts is provided in the town hall.

Contacts for the town of Wayland are Gretchen Schuler (617-358-5238) or Paul Gardescue (617-358-5238).

West Tisbury

The town of West Tisbury completed a community-wide archaeological reconnaissance survey in 1999 (submitted to the Commission at the same time as the Oak Bluffs study). The study was conducted by the University of Massachusetts Archaeological Services under a Survey and Planning Grant funded by the Martha=s Vineyard Commission and the Massachusetts Historical Commission. It was recommended that in the course of its duties the Chilmark Planning Board should identify parcels that require review by the Chilmark Historical Commission. The key to the system is the use of two archaeological sensitivity maps (one for historic sites and the other for prehistoric) that were produced by the survey. The maps indicate areas of archaeological potential. As with the Chilmark study, the prehistoric survey map was made on the basis of the location of previously recorded sites, and a predictive model based on forest change, landform, potential subsistence resources, and patterns evident in other parts of the region. The historic sensitivity map was based on distance to roads, streams (for hydropower industries), agriculturally suitable soils, population and commercial centers, and areas otherwise suitable for historic industry and commerce. If a project proponent proposes a construction project to be located within an area of moderate to high potential to contain sites, the West Tisbury Planning Board would send the project to the West Tisbury Historical Commission for review.

As with Chilmark, an issue that is presently being considered is thresholds established to trigger the review process. It was recommended that Chilmark use their own version of the process developed by the Martha=s Vineyard Commission, in which projects of specific sizes and impact trigger historical review (see below). It was recommended that review not be redundant with the review of the MVC or other review processes (such as Historic District Commission, Massachusetts Historical Commission, or other state and federal agencies). The review processes now in place by these organizations provide consideration of archaeological and historic resources.

The contact persons for the Chilmark Historical Commission are Jill Bouck and Sean Conley.

Westborough

When development is proposed in Westborough, the Westborough Historical Commission is notified by the Planning Board, Zoning Board of Appeals, and Building Inspector. The Commission then reviews the project plans for potential impacts to historic sites. Dr. Curtiss Hoffman of Bridgewater State University reviews projects for prehistoric sites. If the project is sponsored by the municipality or state, the Commission refers review to the Massachusetts Historical Commission. If the project is proposed by a private developer and areas of archaeological potential are to be impacted, the Westborough Historical Commission

recommends that an archaeological survey be conducted at the developer=s expense. If the development is small and to be conducted by a private landowner, a survey is often conducted by the Historical Commission (for historic sites) or Dr. Curtiss Hoffman (for prehistoric sites). Dr. Hoffman does not charge for his services. However, the Historical Commission funds an archaeology laboratory that is used by the Ekblaw Chapter of the Massachusetts Archaeological Society of which Dr. Hoffman is a leading member. The laboratory is located in the Nathan-Fisher House, a town-owned historic building. The Historical Commission is assisted in funding the laboratory through the efforts of the Friends of the Nathan-Fisher House, a private fundraising organization. The town pays for heat and electricity and the Chapter is not charged for rent. If a survey is required, the Historical Commission notifies the Massachusetts Historical Commission.

There is no size threshold that triggers the jurisdiction of the Westborough Historical Commission. Areas of historic and archaeological potential have been predetermined and mapped by the Commission and Dr. Hoffman. The maps are used in the review, but any size project can trigger a recommendation for archaeological survey.

Interestingly, the Historical Commission has been reviewing archaeological projects since 1977, yet there is no legislation in the town concerning archaeological resources. There is ample public interest among the townspeople and local government to protect their archaeological sites.

The contact person for the Westborough Historical Commission is Jacqueline Tidman (508-366-2351).

Cape Cod Commission

The Cape Cod Commission (CCC) is a regional commission that reviews projects determined to have regional impact. If CCC review is triggered through its checklist of review thresholds, sites or potential sites identified by the Massachusetts Historical Commission or a local historical commission may be protected from proposed construction or land alteration. Review by the Commission is triggered for 1) a proposed demolition or substantial alteration that is to occur to a historical or archaeological site that is listed in the National or State Register of Historic Places, or site outside a historic district (the CCC does not review existing historic districts or sites that are already under the jurisdiction of a historic district commission or other review body); 2) construction or expansion of a bridge, ramp, road, or other vehicular access to a water body; 3) subdivisions or developments of 30 acres or more; 4) any development that will divide a parcel into 30 or more lots; 5) any commercial, health, recreational or educational development that includes new construction or use changes of 10,000 square feet or more on indoor facilities, or 40,000 square feet on outdoor facilities; and 6) any development providing transportation facilities. The CCC=s Minimum Performance Standards related to archaeology are as follows:

7.1.3 Where development is proposed on or adjacent to prehistoric or historic archaeological sites as identified by the Massachusetts Historical Commission or local historic commissions, it shall be configured so as to maintain and/or enhance such resources where possible. A pre-development investigation of such sites shall be required before a final

design proposal is submitted. This will minimize difficulties and expense should the site be of archaeological or historic importance.

The project proponent must include an Environmental Notification Plan (ENF) with the application. The application is considered incomplete by the CCC if not included. If the historical review is required, the CCC requests a review from the Massachusetts Historical Commission.

The contact person for the Cape Cod Commission is Sarah Korjeff (508-362-3828).

Boston

The City of Boston funds a City Archaeologist, but there are no overriding archaeological regulations in the City. Reviews of archaeological projects are provided to the City Archaeologist by the Massachusetts Historical Commission for comment. Any project notifications or private inquiries to the City Archaeologist are sent to the Massachusetts Historical Commission for review. Thus, the MHC is the reviewing agency, with comment from the City Archaeologist. Much of the City Archaeologist's time is spent reviewing archaeological issues related to the Central Artery project and in maintaining the City's archaeological laboratory. The remainder is spent in education programs which enhance the public appreciation of archaeology and the importance of preserving the City's important archaeological sites. The contact person is Ellen Birkland (617-635-3850).

Martha's Vineyard Commission

There are no formal regulations concerning archaeology in any of the towns on Martha's Vineyard. However, the Martha's Vineyard Commission, the first regional commission formed in Massachusetts, has review over projects that reach a specific threshold. The Commission has as its mandate the provision of health, safety, and general welfare of Martha's Vineyard residents and visitors. Among the areas of interest covered by their checklist standard is the enhancement of historical and scientific values in light of developments of regional impact. Developments of regional impact concerning archaeological or historical resources include demolition of historic structures as determined by the Historical Commission in areas that are not already within a recognized historical district (and subsequently reviewed by a historic district commission), the Martha's Vineyard Camp Meeting Association, and in towns where no historical boundaries exist. Sites to be protected include those that are listed in the National and State Registers of Historic places. The Commission also considers any subdivision that is identified as having archaeological significance by any state, federal, or local agency (Standards and Criteria Pursuant to Section 12 of Chapter 831 of the Acts of 1977 as Amended).

Archaeological and historic resources are explicitly included in the Commission's checklist. There is a requirement that if there is a site of archaeological significance within a project area, the project must be referred to the Commission for review. The project is then referred to the Massachusetts Historical Commission. A survey can then be required prior to construction. The thresholds include 1) developments which divide a parcel of contiguous ownership of 30 acres or more into six or more parcels; 2) any subdivision of 15 acres or more that was the result of earlier subdivision within eight years; 3) developments that divide land into ten or more lots; 4) any

division of land in a business, commercial, or light industrial zone; 5) any subdivision on active farmland or land identified as prime agricultural land; 6) any development of ten or more dwellings or rental rooms, or four or more businesses. Commercial developments triggering Commission review include new commercial construction of 2,000 square feet or more, additions or auxiliary buildings of 1,500 square feet or more, outdoor commercial space of 6,000 square feet or more, and change of use of floor space of 2,000 square feet or more. Certain piers or harbor facilities, public facilities of 2,000 square feet or greater, and transportation facilities also require review by the Commission.

Contact for the Martha's Vineyard Commission is Charles Clifford (508-693-3453).

Summary

All of the towns and commissions discussed above are far ahead of the hundreds of communities statewide that have no provision for protecting archaeological and historic resources. There are advantages and disadvantages to many of the systems. Towns with procedures that are not included in town regulations protect sites in an unsystematic, opportunistic manner. If a development is brought to the attention of the commission, there is some hope of protection. If not, nothing happens. There is no legal compliance involved and many resources are not protected. Towns that rely on local volunteers or landowners to monitor impacts to archaeological resources have similar shortcomings, unless the volunteers have the proper qualifications to recognize all forms of archaeological resources. Medfield, for example, actually trains developing landowners to monitor their own construction in some circumstances, a practice that limits protection. At the same time their Archaeology Committee has been instrumental in securing funding for professional surveys in the town. Westborough, for example, has as a volunteer, Dr. Curtiss Hoffman, who is a trained archaeologist. On the other hand, Westborough has no formal regulations related to archaeological resources. On the positive side, in all of these situations the public is brought into the process in an informative and supportive manner.

The most effective processes are those used by the two regional commissions. A clear checklist is used to identify projects requiring archaeological and historical review. Once a review is necessary, the project is referred to the Massachusetts Historical Commission for review and recommendations. The MHC's established survey protocol and archaeological permit system ensure consistency and a high quality of results.

RECOMMENDATIONS FOR AN ARCHAEOLOGICAL MANAGEMENT PLAN IN BOLTON

The following recommendations suggest an archaeological management plan, based upon the opinions of the authors and following a review of the several commissions and municipalities that formally consider protection of archaeological resources. Perhaps the most effective models are those provided by the two well-known regional regulatory commissions in eastern Massachusetts: the Martha's Vineyard and Cape Cod Commissions. These are organizations that review construction projects that meet certain criteria or thresholds and then are referred to the Massachusetts Historical Commission.

Initiation of Review

The Bolton Historical Commission (BHC) should review construction projects that have the potential to impact significant archaeological and historical resources. However, it would be impractical for the Commission to review all land-alteration projects that are submitted to town regulatory bodies. Several town commissions and boards receive requests for permits for projects that involve land alteration. Procedures should be established to allow these regulatory organizations to determine which projects require the review of the BHC. This should involve use of the sensitivity maps provided with this document, as well as locational parameters such as distance to water, location within a historic district, etc. These Regulatory Organizations (ROs) include the Planning Board, Conservation Commission, Department of Public Works, and Zoning Board of Appeals. It is predicted that the majority of projects will come from the Planning Board. Occasionally construction is permitted in a wetland buffer that will not have an adverse effect on the wetland, but could destroy archaeological sites. Such projects come under the review of the Conservation Commission. Small road widening projects or those that will disturb undeveloped ground are constructed by the Department of Public Works. Such project areas could contain archaeological resources. The Zoning Board of Appeals is asked to authorize construction projects that depart from zoning ordinances. These projects also could impact archaeological sites. Sites to be identified for review by the BHC would be those that will meet a development threshold established by the Town (see below). Those that meet the threshold and would disturb intact soil, or result in soil alteration in wetland buffers would be sent to the BHC for review.

Archaeological Site Protection Program

A combined effort of the town's Regulatory Organizations and the Historical Commission is desired. Based on the established review thresholds, each individual RO would take the lead role in identifying projects that require the review of the Historical Commission. It is recommended that the Bolton Historical Commission in conjunction with the RO (hereafter called the BHC/RO) implement a program with the purpose of archaeological site protection for both historic and prehistoric sites. The program will involve the establishment of town-sanctioned regulations that outline the BHC's and RO's responsibility and jurisdiction to review certain construction projects in advance, with the intent of minimizing or avoiding adverse impacts to

archaeological resources. The regulations should clearly address the responsibility of key town boards and departments that will notify the BHC in advance of construction and the actions that the BHC is authorized to take. The BHC should be allowed to review any town-sponsored, private, or commercial construction of a pre-determined size and nature. The BHC would determine if the area of proposed construction undertaking is within a town archaeological/historical sensitivity map (provided by Archaeological Services). If the project is located within an area that could contain archaeological and historical sites, the BHC should be able to review the project area and determine whether or not a professional survey is required. If a survey appears to be necessary, the BHC would solicit the advice of the Massachusetts Historical Commission. This assistance would generally be a review of the necessity for survey, and assistance with scopes of work submitted by consultants or prepared by the town. In all surveys recommended by the BHC, the contracted consulting archaeologist should submit a permit application to the MHC. Reasonable thresholds that trigger BHC/RO review should be carefully considered and clearly stated. The following discussion is offered concerning the management plan.

Determining Archaeological Potential

The need for archaeological survey should be based upon archaeological and historical sensitivity maps provided by this project, and updated over the years. These are pre-defined maps showing previously recorded or potential prehistoric and historic sites in the town. These maps have been started by Archaeological Services under the current Survey and Planning Grant. The sensitivity map should be updated continuously as new sites are reported. The map should be considered confidential and the BHC/RO should restrict its use to those who have a BHC/RO-sanctioned need. Such maps should not be made available in the library or to the general public (especially not to adventurous groups such as scouts, amateur archaeologists, bottle-collectors, etc.). It is necessary here to emphasize that casual disclosure of site locations often results in their destruction (as well as the property that they are on), through vandalism or unscrupulous artifact collection.

It is not recommended that a commission, department, or board with geographically limited jurisdiction be relied upon for site protection. For example, in some towns the conservation commission has the responsibility for protecting sites within wetland areas. While this could be an excellent arrangement for some sites, the area of coverage is narrowly limited to streams, lakes, and wetlands. Those sites not linked to wetlands have no protection under this system. It would be better for the BHC to have the review authority and to work with the other RO=s to protect archaeological resources within their jurisdictions.

At the completion of this project, Archaeological Services will provide a series of sensitivity maps that should be used by the BHC/RO in determining whether or not a project may impact historic or prehistoric sites. The maps are overlays on the USGS topographic quadrangle. The maps show the location of prehistoric and historic sites, and also show areas of previously recorded sites and areas of high site potential. Any formal town regulations should be as broad as possible and include areas of high potential (not just previously listed sites). Sensitivity maps provided by Archaeological Services indicate areas of high site potential based upon site locational criteria (e.g., well-drained soils, level to slight slopes near a water supply, etc.), as well

as previously recorded historic or prehistoric sites. Sites that are previously recorded or listed in site repositories constitute a very small number of those sites that actually exist and are obscured by soil and vegetation. The sites with the most archaeological potential often are those that are previously unrecorded and undisturbed. The sites that are on record frequently have been brought to our attention because they have been disturbed (e.g., through a development or through artifact collecting).

Regulatory Review Thresholds

The threshold used to trigger review by the BHC is an important consideration. To review all proposals for construction within the Town would be an overwhelming task. If the area or size of construction is too small, the BHC may not have the time or resources to effectively review projects, and public opposition may be strong. The review threshold should carefully be considered with BHC/RO resources and capabilities in mind. Smaller developments of a minimum of two single-family homes, sand-and-gravel operations larger than one-half acre, town construction or development (e.g., road realignments, town wells, landfill or transfer stations, park improvements, cemetery expansion, etc.) are potential components of a threshold checklist. A system should be established whereby the Planning Board, Zoning Board of Appeals, Conservation Commission, Building Inspector, Department of Public Works, and other RO=s notify the BHC of proposed construction when thresholds are met and permit review.

Overlap with Existing Laws and Protection Measures

The BHC should avoid overlap with other archaeological reviews that are already covered by law. The BHC would be included already, for example, in reviews by the Massachusetts Historical Commission and should not duplicate the effort. The MHC reviews projects in which sites are afforded protection under the Massachusetts Environmental Policy Act, the National Historic Preservation Act, etc. These projects already require archaeological survey and are permitted through the Massachusetts Historical Commission. Highway construction projects conducted by the Massachusetts Highway Department come under review of the MHD Staff Archaeologist and ultimately the MHC. Under such projects, the MHD would contract with a qualified archaeological consultant to conduct an archaeological survey in advance of the project.

In the development stage of such projects, the BHC would be notified of a project located within the town and its input would be sought. Generally, a letter requesting an archaeological survey is sent to the project proponent, and a copy is forwarded to the local historical commission. The BHC can request a copy of any reports from archaeological surveys conducted within the town. The source would be the agency or firm actually conducting the research. If conducted properly, any archaeological survey includes a notification of the local historical commission by the professional consultant conducting the survey. If the project is conducted for a private firm, the OBHC can request that the Massachusetts Historical Commission include in their letter requiring survey a request that a copy of the final report be provided to the commission.

Avoidance of Monitoring and Archaeological Salvage Situations

Monitoring by members of the BHC as a regular practice is not recommended. Monitoring is a last-ditch effort that does not protect sites, because the project is already underway and is actively in the process of disturbing archaeological contexts. Thus, the monitors find previously disturbed features and sites. Furthermore, once construction is underway, it is very difficult to stop it. Halting a construction crew already under contract can be extremely expensive. If the halt is the result of locating an important archaeological site, time would be necessary to determine what steps must be taken to recover information, and/or to protect the site. If surveys are not conducted at the feasibility stage of a project, and monitoring is substituted, it would be possible that a site may be located at a very inopportune time, requiring a costly, although temporary, suspension.

Recommending Archaeological Surveys

If a proposed construction project is located on the town=s archaeological sensitivity map, but is in an area already disturbed or considered to be of low potential because of environmental factors (e.g., excessive slope, bedrock, wet ground), the project should require no survey. Exceptions are historic sites situated on historically altered land associated with the site. If the project is located on essentially undisturbed ground and is in a zone of moderate to high potential to contain sites, or in the vicinity of a previously recorded site, the BHC would provide advice to the project proponent in the hope that project plans could be modified to avoid impacting the site. If modification were not possible, then the BHC would recommend that an archaeological survey be conducted prior to ground alteration. The archaeological survey should include a carefully considered research and sampling design. If an archaeological survey appears to be required, the BHC should request comment from the Massachusetts Historical Commission. The MHC can assist the BHC in preparation of an appropriate scope of work and can advise on the necessity of a survey. The cost of conducting a survey should be borne by the project proponent.

Surveys in the state of Massachusetts generally consist of a site locational survey (called an archaeological Aintensive@ survey) that has as its purpose the discovery of sites within a project area. In areas that are large, the background research portion of a site locational survey (called a reconnaissance) is useful in determining the need for further survey. If sites are found during an intensive (locational) survey and they appear likely to be historically significant, a site examination archaeological survey is generally recommended. The site examination determines the boundaries of the site; assesses the significance, research potential, integrity, and clarity of data; and determines whether or not the site may be eligible for inclusion in the State and National Registers of Historic Places. If not, the survey process ends. If the site appears to be eligible, recommendations are provided for protection of the site through avoidance, modification of construction plans, site preservation restrictions, or data recovery. The latter is a final phase of survey that occurs only when there are no other alternatives. The data recovery phase is a full-scale archaeological excavation that recovers the data that make the site eligible for inclusion in the National and State Registers. Because of the broad coverage of most data recovery projects, and the sophisticated analytical techniques employed, the cost is generally very high.

Establishment of Town Regulations and By-Laws

Formal, clear, town-sanctioned regulations or by-laws are very important to add legitimacy and strength to site preservation efforts. Archaeological Services recommends that actual regulations be modeled after those in use by the regional commissions on Cape Cod and the Islands. These regional commissions were one of the first to effectively include protection of cultural resources. They include the Cape Cod Commission and the Martha's Vineyard Commission. A summary of these regulations is included in this report. The regulations should be clear about the nature of review thresholds, and which town regulatory organizations are responsible for notifying the BHC when a threshold is reached. Logical commissions and departments include the following: the Planning Board, Building Inspector, Zoning Board of Appeals, Conservation Commission, and Department of Public Works.

In the town of Bolton, several of these regulatory organizations may prompt a review by the BHC. The Planning Board, and Zoning Board of Appeals are the logical organizations to identify large projects that require BHC review. The Building Inspector is the logical trigger for smaller projects. A threshold should be established through legal means (e.g., two single-family homes, or one home, or developments of a specific size, etc.). The jurisdiction of the Planning Board and other protective governing bodies should not overlap. Rather, the BHC should review those sites that do not come under the jurisdiction of any other agency or commission.

In preparing by-laws and regulations, the BHC should be careful to avoid including statements that are so specific that they disable the intent of the regulation. An excellent and unfortunate example of this is the statement in Barnstable's by-laws that areas that abut wetlands are not considered significant. The intent of this by-law is very clear to the casual reader, but the statement eliminates the possibility of protecting sites in the very areas the regulation was designed to protect. Unfortunately the type of area excluded has the highest potential to contain prehistoric sites, namely, the well-drained, level terraces within the buffer zones of wetlands and streams.

Education and Public Participation

The BHC should develop a public education program that would provide the public with appreciation of the importance of prehistoric and historic sites. Grants might be applied for to develop the program. The focus of the program should be to raise the consciousness of archaeological issues in the town. Education is one of the most effective means of providing protection for sites and costs very little. Appreciation of the importance of archaeological sites begins with the very young. Today's curriculum in elementary and secondary schools often includes archaeology and history. It is important for the BHC to establish a relationship with curriculum development personnel in the local schools to assist in the development of programs that teach local history and prehistory. Possible contributions might be lectures and school presentations, the development of text or displays to be used in the schools, and prizes for student projects concerning archaeology and the protection of archaeological sites. Displays concerning archaeological site protection could be mounted at the town library and town hall. The BHC should regularly sponsor public presentations concerning the archaeology of the town and immediate vicinity, especially concerning successful preservation programs. There are many archaeological and historical faculty members and graduate students who live in the area and are

associated with universities and colleges in the area who could be asked to speak, especially in conjunction with Archaeology Week in October of each year. Information about Archaeology Week can be obtained from the Massachusetts Historical Commission (617-727-8470). An artifact identification session is a popular addition to presentations, encouraging townspeople to bring artifacts for identification. Through such events, many previously unreported sites may become known to the Commission. With increased public appreciation of archaeological sites, damage and looting may be reduced.

SUMMARY AND RECOMMENDATIONS

The Town of Bolton should adopt a by-law designed to protect historic and archaeological sites from destruction through land-alteration activities. The Town of Bolton has a wealth of historic and prehistoric archaeological sites within its boundaries. Many of the sites are undisturbed. Large-scale development is still a threat in the town and the surrounding area with much open land still in existence, especially in the south of town. The planned construction by a large industrial company that plans to build a complex in a nearby town, staffed by nearly 5,000 employees will have major residential impacts on Bolton. Small housing developments and even single-family homes, Title 5 septic facility upgrades, road widening, and similar construction projects can impact archaeological sites.

It is recommended that the town establish a system of review designed to protect important archaeological sites and areas of high site potential. The system should begin with a review authority through which proponents of construction apply for permits. The logical groups in town include the Bolton Planning Board, Conservation Commission, Zoning Board of Appeals, Department of Public Works and Building Inspector. Using site sensitivity maps provided with this document, the regulatory organization can determine if a proposed construction site falls within a zone of high to moderate site potential. If it does, the project should be given to the Bolton Historical Commission for review. If the Historical Commission, using the site potential outlined in the survey units described in the report, soils maps and historic maps determines that a site may be impacted and could be significant, the advice of the Massachusetts Historical Commission should be requested. If through this process a site is determined to be significant, the proponent should be encouraged to modify project plans to avoid the site, and place it under a Site Preservation Restriction. The Site Preservation Restriction is a legal document in which the proponent agrees not to damage the site. Compliance review is the responsibility of the BHC. Should development be proposed in the future, the Commission would require an archaeological survey. Compliance of Site Preservation Restrictions would be the duty of the Commission. If the option of a Site Preservation Restriction is not acceptable or feasible for the proponent, the survey requirement would apply.

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APPENDIX
Persons Consulted during the Bolton Reconnaissance

Donald and Pamela Anderson, Bolton residents

Edward Bell, Staff Archaeologist, Massachusetts Historical Commission

Iris Berdrow, Local Project Coordinator and member of the Bolton Historical Commission

Harold Brown, Bolton Department of Public Works

Kelly Collins, Librarian, Bolton Public Library

Betsy Cussen, Town Clerk, Bolton

Linda Engelmann, Chair of the Bolton Historical Commission

Graham Entwistle, Photographer, *Bolton Common*

Dale Farrell, avocational archaeologist, Bolton

Timothy Fiehler, President, Bolton Historical Society

Rae Gould, Tribal Historic Preservation Officer, Nipmuc Nation, Sutton

Curtiss Hoffman, Archaeologist, Bridgewater State College

Cheryll Holley, Tribal Representative, Nipmuc Nation, Sutton

Ed Hood, Historian, Old Sturbridge Village

Eric Johnson, Staff Archaeologist, Massachusetts Historical Commission

Leonard Loparto, Staff Archaeologist, Massachusetts Historical Commission

Nathan Mayo, Bolton resident

Mary Ann McLeod, Massachusetts Archaeological Society, Sterling

Susan Miles, Assistant Town Clerk, Bolton

Kenneth Nicewicz, Bolton resident

Martha Pinello, Archaeologist, Strawberry Bank Museum, New Hampshire

Herbert Randall, Bolton resident

Alice Roemer, Bolton resident

Gerald Smith, Northborough resident

Michael Steinitz, Grant Manager, Massachusetts Historical Commission

Ed Sterling, Chairman, Long Range Planning Committee, Bolton