APPENDIX H

Historic and Archaeological Reconnaissance Survey Report

Concord River Diadromous Fish Restoration Feasibility Study
HISTORIC AND ARCHAEOLOGICAL RECONNAISSANCE SURVEY
CONCORD RIVER DIADROMOUS FISH RESTORATION PROJECT
TALBOT MILLS DAM

Billerica, Massachusetts

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Submitted to:

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The Public Archaeology Laboratory, Inc. (PAL) has completed a historic and archaeological reconnaissance survey for the proposed Concord River Diadromous Fish Restoration Project at the Talbot Mills Dam (the Project) in Billerica, Massachusetts. The Talbot Mills Dam (Dam No. MA00774, aka the Middlesex Canal Dam and Locks—MHC No. BIL.900) is a historic property listed in the National Register of Historic Places (National Register) as a contributing resource to the Middlesex Canal Historic and Archaeological District (MHC Nos. BIL.T, BIL.K, BIL.P) and is a potential contributing resource to the Billerica Mills Historic District (MHC Nos. BIL.O, BIL.E). The historic and archaeological reconnaissance survey focused on the dam structure and adjacent lands to either side of the Concord River mill pond and consisted of an existing conditions inventory and assessment of recorded historic and archaeological resources; an archaeological sensitivity assessment; and a recommended (preliminary) Area of Potential Effects (APE). Archival research and visual field survey were conducted to locate and identify any visible historic resources and archaeological sites and archaeologically sensitive areas where potentially significant belowground resources may be present.

The Project proponents are currently exploring two conceptual alternatives at Talbot Mills Dam to restore diadromous fish to the upper Concord River system: 1) construction of a concrete Denil fish ladder attached to the river right (northeasterly) concrete abutment of the dam (with or without an eel ramp add-on and/or notch in the spillway for downstream fish passage), or 2) dam removal. Either alternative would cause direct impacts on historic properties (as defined under 36 CFR 800.5). The potential direct Project APE contains the Talbot Mills Dam, aka the Middlesex Canal Dam and Locks (MHC No. BIL.900/BIL-HA-09); the historic Middlesex Canal Segment 24 (MHC Nos. BIL.P, BIL.T, BIL.929/BIL-HA-08, listed in the National Register); the canal floating towpath peninsula (MHC No. BIL-HA-39); and the canal floating towpath anchor stone (MHC No. BIL-HA-40). The Talbot Mills Dam was constructed in 1828–1829 and occupies a site that was dammed as early as the eighteenth century to provide waterpower for grain or textile mills. The dam was essential to the function of the Middlesex Canal and to the Faulkner Mills and the Talbot Mills within the Billerica Mills Historic District, providing water for canal navigation and textile manufacturing during the historic period of operations.

The Talbot Mills Dam included a fish ladder during the historic period of operation. If reinstitution of a fish ladder structure is selected as the preferred alternative, PAL recommends that the design of the new structure should conform to the Secretary of the Interior’s Standards for the Treatment of Historic Properties (SOI Standards, 36 CFR Part 68) to minimize potential adverse effects to the Middlesex Canal Historic and Archaeological District and to the North Billerica Mills Historic District. Further research about the location and appearance of the historic period fish ladder would be recommended so that any new design is sympathetic to the surrounding historic context of the districts, requires minimal alterations to the dam, and is thus compliant with the SOI Standards. Implementation of the eel ramp add-on should also conform to the SOI Standards such that it does not change the character of the property. The cutting of a notch in the dam spillway would represent the destruction or alteration of part of the historic dam and would result in an adverse effect. It would also constitute an adverse effect on the Middlesex Canal Historic and Archaeological District if the lowering of the water level in the impoundment changes the functional relationship of the impoundment, lock, Canal Segment 24, Floating Towpath Peninsula, and the Floating Towpath Anchor Stone.

The removal of the Talbot Mills Dam would constitute an adverse effect on the Middlesex Canal Historic and Archaeological District and the Billerica Mills Historic District by destroying an important contributing resource and altering the functional relationship of the impoundment, lock, Canal Segment 24, Floating Towpath Peninsula, and the Floating Towpath Anchor Stone of the Middlesex Canal.
The Talbot Mills Dam is within the North Billerica Mills Local Historic District (LHD). Because any new construction or alterations to the exterior of buildings and structures within the LHD will not receive a building permit until the proposed work has been issued a certificate of appropriateness from the Billerica Historic Districts Commission (BHDC), PAL recommends consultation with the BHDC regarding the Project (BHDC 1990, 2015).

The potential direct Project APE is assigned high sensitivity for both pre-contact Native American and post-contact Euro-American archaeological resources. The dam, abutments, retaining/training walls, and open paved area on the northeast side of the dam are assigned high archaeological sensitivity for the potential to contain buried remains of earlier dam structures and/or early fishway/fish ladder structures, and buried structural remains of a mid-nineteenth-century dye/store house associated with the Faulkner Manufacturing Company. The upstream dam impoundment and shorelines are also assigned high sensitivity for both pre-contact Native American resources and post-contact structural elements associated with the Middlesex Canal (canal prism, floating towpath, and towpath anchor stone).

If reinstitution of a fish ladder structure is selected as the preferred alternative, PAL recommends archaeological monitoring in the high-sensitivity areas during construction of the fish ladder and any optional add-ons. The archaeological monitoring would be designed to identify and record any buried surviving components of the documented early through late eighteenth-century dams and/or fishways. Any such structural remains that may be exposed during construction activities have the potential to contribute to an understanding of the historic waterpower infrastructure of the Talbot Mills Dam as a contributing resource to the Middlesex Canal Historic and Archaeological District and a potential contributing resource to the Billerica Mills Historic District.

If removal of the Talbot Mills Dam is selected as the preferred alternative, PAL recommends archaeological monitoring in the high-sensitivity area at the dam during removal activities to record the ca. 1828 dam and any potentially intact portions of earlier dam and/or fishway structures. Loammi Baldwin’s 1798 Middlesex Canal Dam is reported to lie immediately upstream of the current (ca. 1828) Talbot Mills Dam. If the 1798 dam remains and possesses integrity, it would have strong associations with the development of the Middlesex Canal and would be a potential contributing resource to the Middlesex Canal Historic and Archaeological District and the Billerica Mills Historic District. If removal of the Talbot Mills Dam also necessitates the removal of the 1798 Middlesex Canal Dam, this activity may also constitute an adverse effect. Archaeological monitoring and recordation would be required to confirm the presence of this resource and its status as a historic property within the historic districts.

Dam removal would also create a permanent drawdown of the approximately 8.6-acre upstream dam impoundment (Mill Pond) and expose and potentially impact archaeologically sensitive upland shoreline and underwater ground surfaces. Archaeological walkover with close ground surface inspection would be needed for the high-sensitivity pond shoreline and exposed impoundment drawdown areas to locate and identify any potentially significant pre-contact Native American archaeological resource areas and any buried remains of the documented Middlesex Canal elements, including the canal prism, the floating towpath associated with the peninsula, and the towpath anchor stone.

For both proposed Project alternatives, access and staging would likely be concentrated in the small paved open area above the stone retaining wall between the river right abutment and Faulkner Street. If any construction activities are proposed for the open paved area for staging/access, including the construction of a ramp into the river channel that would directly impact soils below the paved ground surface or the existing retaining/training wall, PAL recommends intensive archaeological survey prior to construction and/or archaeological monitoring during construction in the high-sensitivity area to identify and record any potentially significant buried structural remains associated with the mid-nineteenth-century dye/store house and earlier dam retaining walls.
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CHAPTER ONE

INTRODUCTION

This report presents the results of a historic and archaeological reconnaissance survey conducted by The Public Archaeology Laboratory, Inc. (PAL) for the proposed Concord River Diadromous Fish Restoration Project at the Talbot Mills Dam (the Project) in Billerica, Massachusetts, under contract to Gomez and Sullivan Engineers, DPC.

Project Description

The Massachusetts Department of Fish & Game’s Division of Marine Fisheries and its project partners, the National Oceanic and Atmospheric Administration (NOAA) and the Fish and Wildlife Service of the Department of the Interior (USFWS), are working to restore populations of sea-run or diadromous fish to the upper Concord River system. The primary impediment to diadromous fish passage in the Concord River is the Talbot Mills Dam (Dam No. MA00774, aka the Middlesex Canal Dam and Locks—MHC No. BIL.900) in Billerica, Massachusetts (Figures 1-1 and 1-2). As part of the Project, this privately owned structure (CRT Development Realty) may need to be removed or modified to provide fish passage in the Concord River. The project partners have contracted with Gomez and Sullivan Engineers to prepare a feasibility analysis for the Project, which will focus on an approximate 36-acre study area that extends from Pollard Street about 0.5 mile upstream of the dam to a point slightly downstream on the west side of Faulkner Street, including the pond/mill impoundment (Figure 1-3).

Figure 1-1. Map of Massachusetts showing the location of Billerica.
Figure 1-2. Location of the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area on the USGS Billerica, MA, topographic quadrangle, 7.5-minute series.
Figure 1-3. Feasibility analysis study area, Concord River Diadromous Fish Restoration Project–Talbot Mills Dam (source: Gomez and Sullivan Engineers 2016).
The Talbot Mills Dam consists of a run-of-the-river type stone and concrete structure approximately 11 feet (ft) high and 165 ft long, flanked by stone abutments that formerly contained a fish ladder and waste gates (now removed) (Figure 1-4). The abutments tie into stone and concrete retaining/training walls that define the river impoundment and downstream channel. The dam is privately owned by CRT Development Realty, LLC (CRT), is classified as a Significant (Class II) Hazard Potential structure by the Massachusetts Office of Dam Safety, and was rated to be in fair condition in the most recent (2015) safety inspection (Geotechnical Consultants, Inc. 2015; Gomez and Sullivan Engineers 2016). The dam spans the Concord River on a northeast–southwest alignment approximately 30 ft east of Faulkner Street/Old Elm Street, which crosses the river via a concrete arch bridge immediately downstream of the dam. The Talbot Mills Dam, aka the Middlesex Canal Dam and Locks (MHC No. BIL.900), was constructed in 1828–1829 and occupies a site that was dammed as early as the eighteenth century to provide waterpower for grain or textile mills. Water reserved by the current structure was utilized by two mill complexes in the nineteenth century: the Faulkner Mill founded in 1811 on the eastern bank and the Talbot Mill founded in 1857 on the western bank (both included in the Billerica Mills Historic District [MHC Nos. BIL.O, BIL.E] listed in the National Register of Historic Places (National Register).

The historic Middlesex Canal (MHC Nos. BIL.P, BIL.T, BIL-HA-08, listed in the National Register), was built near the dam in 1794 and used the mill impoundment water as a source to fill the canal. In the immediate vicinity are the Middlesex Canal Talbot Mill Lock and Dam archaeological site (MHC No. BIL-HA-09, associated with MHC No. BIL.900) and several other canal features, including a floating towpath peninsula (MHC No. BIL-HA-39) and floating towpath anchor stone (MHC No. BIL-HA-40), which were recorded by PAL in 1998 as part of a comprehensive survey of archaeological properties along the entire route of the historic Middlesex Canal between Charlestown and Lowell that was completed for the Middlesex Canal Association.

The Talbot Mills complex is approximately 30 ft southwest of the southwest end of the dam, on the opposite side of Old Elm Street/Faulkner Street. The Faulkner Mills complex is approximately 100 ft northwest of the dam, on the northerly side of Old Elm Street/Faulkner Street. A paved area associated with the Faulkner Mills complex adjoins the dam’s northeasterly retaining/training walls and abutment. The retaining/training wall at the southwest abutment extends to the south parallel to Old Elm Street/Faulkner Street to define the shore of the impoundment (see Figure 1-4). Farther upstream, the banks of an approximately 8.6-acre¹ impoundment (known as the Mill Pond), extending south from the dam, are largely wooded. The above-referenced features and structures associated with the Middlesex Canal intersect with and cross the dam impoundment on a southeast–northwest axis that lies approximately 150 ft from the dam at its nearest point and 1,000 ft from the dam at its most distant point in the impoundment.

Design for the fish passage restoration is currently at the conceptual stage. The fishway alternative would consist of the construction of a concrete Denil fish ladder attached to the river right (northeasterly) concrete abutment of the dam (Figure 1-5). A notch would be cut in the abutment to allow attachment of the fish ladder, which would also be anchored to the stone retaining wall downstream. Optional add-ons that would supplement the functionality of the fish ladder are under consideration. An eel ramp may be anchored directly to the dam spillway and/or a notch may be cut into the dam spillway for purposes of downstream fish passage to direct fish passing over the dam to a deeper plunge pool (see Figure 1-5). The notch would be on the river left (southwesterly) end of the spillway and would be of similar size and dimensions to the notch for the fish ladder.

¹ The size of the dam impoundment is estimated during periods of “normal” flow and includes the lower portions of two branches of river; the main channel of the Concord River is on the west and has a deep, strong current through most of the year (Geotechnical Consultants, Inc. 2015).
Figure 1-4. Existing conditions plan, Concord River Diadromous Fish Restoration Project—Talbot Mills Dam, with PAL annotations (Gomez and Sullivan Engineers 2016).
Figure 1-5. Alternative 1, conceptual fishway plan, with optional add-ons, including an eel ladder (Gomez and Sullivan Engineers 2016).
The dam removal alternative would consist of removing the entire dam spillway down to bedrock and possibly removing one or both abutments (Figure 1-6). Sediment removal or grading activities are anticipated to be negligible, because there is not much sediment accumulated behind the dam. Access and staging for the two alternatives would likely be concentrated in the small paved open area above the stone retaining wall between the river right abutment and Faulkner Street (see Figure 1-4). The means of access for equipment to enter the river channel below the dam is not determined, but a ramp leading down from the stone river retaining wall would likely be needed.

Authority

Federal and state funding and permitting sources are still being determined for the Project, but it is anticipated that there will be review under Section 106 of the National Historic Preservation Act (NHPA), as amended, and its implementing regulations (36 CFR 800), and in accordance with Massachusetts General Laws, Chapter 9, sections 26-27C (950 CMR 70/71) and possibly the Massachusetts Environmental Policy Act (301 CMR 11). As such, the Project partners requested the completion of a historic and archaeological reconnaissance survey (950 CMR 70) as part of the proposed feasibility analysis for the Project.

PAL Scope

The reconnaissance survey area focused on the dam structure and adjacent lands to either side of the Concord River mill pond and consisted of an existing conditions inventory and assessment of recorded historic and archaeological resources; an archaeological sensitivity assessment; and a recommended (preliminary) Area of Potential Effects (APE). Archival research and visual field survey were conducted to locate and identify any visible historic resources, archaeological sites and archaeologically sensitive areas where potentially significant belowground resources may be present.

A project’s Area of Potential Effects (APE) is defined in the National Historic Preservation Act Section 106 regulations as the “geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or uses of historic properties, if any such properties exist” (36 CFR 800.16[d]). Direct effects are those that may result from a physical disturbance, taking, demolition, alteration, or relocation of a historic property. Indirect effects are those that may cause changes in the property’s use, result in alterations to features of the property’s setting that contribute to its significance, and/or introduce “visual, atmospheric or audible elements that diminish the integrity of the property’s significant historic features” (36 CFR 800.5[2]). Depending on the nature of the potential project impacts, one or more APEs may be established to address the direct and indirect effects, which may differ for aboveground resources (historic structures and landscapes) and subsurface resources (archaeological sites).

PAL conducted the historic and archaeological reconnaissance survey under State Archaeologist’s Permit Number 3511, issued by the MHC on November 18, 2014. All survey tasks were carried out in accordance with the standards outlined in the Secretary of the Interior’s Standards and Guidelines for Archeology and Historic Preservation (48 FR 44716–44742, NPS 1983) and with the MHC’s Public Planning and Environmental Review: Archaeology and Historic Preservation (1985) and were completed in compliance with the applicable Massachusetts General Laws. This technical report follows the guidelines established by the National Park Service in the Recovery of Scientific, Prehistoric, Historic, and Archeological Data (36 CFR Part 66, Appendix A) and by the MHC. PAL personnel involved in the survey meet the Secretary of the Interior’s Professional and Qualification Standards (36 CFR Part 61, Appendix A).
Figure 1-6. Alternative 2, conceptual dam removal plan (Gomez and Sullivan Engineers 2015).
Personnel

Archival research and walkover survey were conducted from January to May 2015. PAL personnel involved in the project were Suzanne Cherau (senior archaeologist/principal investigator), John Daly (senior industrial historian), Jennifer Banister (project archaeologist), and Dylan Peacock (assistant architectural historian).

Disposition of Project Materials

All project information (e.g., field notes, maps, and photographs) is currently on file at PAL, 26 Main Street, Pawtucket, Rhode Island. PAL serves as a temporary curation facility until a permanent state repository is designated.
CHAPTER TWO
METHODOLOGY

The goals of the historic and archaeological survey were to provide a recommended (preliminary) APE for the Project, to identify historic resources more than 50 years of age within the APE, and to identify within the APE the presence of any inventoried archaeological sites and potentially significant belowground resources that may be eligible for listing in the State or National Register of Historic Places. As Project plans permit, recommendations concerning potential Project impacts, related effects to historic properties, and ways to avoid, minimize, or mitigate adverse effects were to be provided. To accomplish this objective, two research strategies were used:

- archival research, including a review of historical literature and maps; and
- field investigations, consisting of a “walkover” assessment survey.

The archival research and walkover survey provided the information necessary to develop environmental and historic contexts for the project area and a predictive model for archaeological sensitivity. Archaeological sensitivity is defined as the likelihood for belowground cultural resources to be present and is based on the following:

- geographical, functional, and temporal characteristics of previously identified cultural resources in the study area and its vicinity; and
- local and regional environmental data reviewed in conjunction with existing study area conditions documented during the walkover survey, and archival research about the study area’s land use history.

Significance and Historic Contexts

The different phases of archaeological investigation (reconnaissance survey, intensive [locational] survey, site examination, and data recovery) reflect preservation planning standards for the identification, evaluation, registration, and treatment of archaeological resources (National Park Service [NPS] 1983). An essential component of this planning structure is the identification of archaeological and traditional cultural properties that are eligible for inclusion in the National Register. Archaeological properties can be a district, site, building, structure, or object, but are most often sites and districts (Little et al. 2000). Traditional cultural properties are defined generally as ones that are eligible for inclusion in the National Register because of their association with cultural practices or beliefs of a living community that (a) are rooted in that community’s history, and (b) are important in maintaining the continuing cultural identity of the community (Parker and King 1998). The results of professional surveys and consultation with Native American or other ethnic communities are used to make recommendations about the significance and eligibility of archaeological and traditional cultural properties.

An archaeological property may be pre-contact, post-contact, or contain components from both periods. Pre-contact (or what is often termed “prehistoric”) archaeology focuses on the remains of indigenous American societies as they existed before substantial contact with Europeans and the resulting written records (Little et al. 2000). In accordance with the NPS guidelines, “pre-contact” is used, unless directly quoting materials that use “prehistoric.” There is no single year that marks the transition from pre-contact to post-contact.
Post-contact (or what is often termed “historical”) archaeology is the archaeology of sites and structures dating from time periods since significant contact between Native Americans and Europeans. Documentary records and oral traditions can be used to better understand these properties and their inhabitants (Little et al. 2000). Again, for reasons of consistency with the NPS guidelines, “post-contact” is used when referring to archaeology of this period, unless directly quoting materials that use “historical.”

The NPS has established four criteria for listing significant properties in the National Register (36 CFR 60). The criteria are broadly defined to include the wide range of properties that are significant in American history, architecture, archaeology, engineering, and culture. The quality of significance may be present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. The criteria (known by the letters A–D) allow for the listing of properties

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
B. that are associated with the lives of persons significant in our past; or
C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. that have yielded, or may be likely to yield, information important to prehistory or history.

Archaeological and traditional cultural properties can be determined eligible for listing in the National Register under all four criteria (Little et al. 2000; Parker and King 1998). Significance under any of these criteria is determined by the kind of data contained in the property, the relative importance of research topics that could be addressed by the data, whether these data are unique or redundant, and the current state of knowledge relating to the research topic(s). A defensible argument must establish that a property “has important legitimate associations and/or information value based upon existing knowledge and interpretations that have been made, evaluated, and accepted” (McManamon 1990:15).

Another critical component in assessing the significance of a historic property is an evaluation of its integrity. Historic properties either retain integrity (i.e., convey their significance) or they do not. The National Register criteria recognize seven aspects or qualities that, in various combinations, define integrity:

- location, the place where the historic property was constructed or the place where the historic event occurred;
- design, the combination of elements that create the form, plan, space, structure, and style of a property;
- setting, the physical environment of a historic property;
- materials, the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property;
- workmanship, the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory;
- feeling, a property’s expression of the aesthetic or historic sense of a particular period of time; and
- association, the direct link between an important historic event or person and a historic property.
To retain historic integrity, a property will always possess several, and usually most, of these qualities. The retention of specific aspects of integrity is paramount for a property to convey its significance. Determining which of these aspects or qualities are most important to a particular property requires knowing why, where, and when the property is significant (NPS 2002).

The criteria are applied in relation to the historic contexts of the resources as follows:

A historic context is a body of thematically, geographically, and temporally linked information. For an archaeological property, the historic context is the analytical framework within which the property’s importance can be understood and to which an archaeological study is likely to contribute important information (Little et al. 2000).

For traditional cultural properties, a historic context is further defined as follows:

A historic context is an organization of available information about, among other things, the cultural history of the area to be investigated, that identifies “the broad patterns of development in an area that may be represented by historic properties” (48 FR 44717). The traditions and lifeways of a planning area may represent such “broad patterns,” so information about them should be used as a basis for historic context development. Based on federal standards and guidelines, groups that may ascribe traditional cultural values to an area’s historic properties should be contacted and asked to assist in organizing information on the area (Parker and King 1998).

The formulation of historic contexts is a logical first step in the design of an archaeological investigation and is crucial to the evaluation of archaeological and traditional cultural properties in the absence of a comprehensive survey of a region (NPS 1983:9). Historic contexts provide an organizational framework that groups information about related historic properties based on a theme, geographic limits, and chronological periods. A historic context should identify gaps in data and knowledge to help determine what significant information may be obtained from the resource. Each historic context is related to the developmental history of an area, region, or theme (e.g., agriculture, transportation, and waterpower), and identifies the significant patterns of which a particular resource may be an element. Only those contexts important to understanding and justifying the significance of the property need be discussed.

Historic contexts are developed by

- identifying the concept, time period, and geographic limits for the context;
- collecting and assessing existing information about these time periods;
- identifying locational patterns and current conditions of the associated property types;
- synthesizing the information in a written narrative; and
- identifying information needs.

“Property types” are groupings of individual sites or properties based on common physical and associative characteristics. They serve to link the concepts presented in the historic contexts with properties illustrating those ideas (NPS 1983, 48 FR 44719).

The following historic research contexts have been developed to organize the data relating to the archaeological resources identified within the project area:
1. Pre-contact Native American land use and settlement in the Concord River drainage, circa (ca.) 12,500 to 450 years before present (B.P.); and
2. Post-contact land use and settlement patterns in Billerica, Massachusetts, ca. A.D. 1650 to present.

Archival Research

The development of a cultural context and a predictive model of expected property types and densities within the project area began with archival research, consisting of an examination of primary and secondary documentary sources. These sources include written and cartographic documents relating both to past and present environmental conditions as well as documented/recorded sites in the general project area. The information contained in the following archival sources formed the basis of the predictive models developed for the project area and were an integral part of the archaeological investigations.

State Site Files, Artifact Collection Reports, and Town Reconnaissance Surveys

PAL reviewed the state archaeological and historic resource inventory files including National Register nomination forms, archaeological site files, and the State Register of Historic Places, maintained at the MHC, for relevant information regarding the dam or other National Register-listed or eligible properties in the Project vicinity. The state site files provided information about the location, temporal affiliation, and other data about known pre-contact and post-contact archaeological sites. The MHC Inventory of the Historic and Archaeological Assets of the Commonwealth (MHC Inventory) was reviewed to identify previously recorded architectural and archaeological sites in the Project vicinity. Relevant National Register forms included Billerica Mills Historic District (1983), Middlesex Canal (Hale 1972), and Middlesex Canal Historic and Archaeological Area (2009).

Cultural Resource Management Reports

Reports documenting cultural resource management (CRM) investigations conducted in the project vicinity were reviewed. These reports included studies conducted by PAL (Russo and Kierstead 1999; Pasquariello and Mair 2002; Ritchie and MacPherson 2002).

Histories and Maps

Primary and secondary histories and historical maps and atlases were examined to assess changes in land use, to locate any documented structures, and to trace the development of transportation networks (an important variable in the location of post-contact archaeological sites). Town, county, state, and regional histories (Donahue 1989; Hazen 1883), Middlesex Canal and mill privilege histories (Clark 1974; Ingraham 1995; Seaburg and Dahill 1997) and historical maps and atlases (Beers 1875; Burleigh 1887; Hales 1831; Hutchins 1897; Walker 1889; Walling 1853; Whiting 1794) were consulted to locate possible sites dating to this period within and close to the project area. Additional resources reviewed to document changes to the physical landscape within the project area over time included historical aerial photographs (NETR 1938–2005), historical USGS quadrangle maps (USGS 1893–1979), and Sanborn Fire Insurance Maps (Sanborn 1892–1950).

Environmental Studies

Bedrock and surficial geological studies provided information about the region's physical structure and about geological resources near the project area. The United States Department of Agriculture (USDA) Soil Conservation Service soil survey of Middlesex County (2009) and their National Resources Conservation Service website (USDA-NRCS 2015) supplied information about soil types and surficial
deposits within the Project area and the general categories of flora and fauna that these soil types support. In addition, studies of past environmental settings of New England were consulted.

Walkover Survey

PAL conducted a walkover survey of the dam structure and adjacent land areas to document and to assess present environmental conditions. The field effort included close ground surface inspection of the dam site and an evaluation of the surrounding environments to assist in preparation of recommended Areas of Potential Effects (APEs) for archaeological and historic resources in relation to fish passage and dam removal options put forth in the Feasibility Analysis. Notes on the appearance of the dam site, the upstream and downstream river banks and impoundment (to the extent feasible from public ways), and surrounding viewsheds were recorded and digital photographs were taken. The historic resources survey recorded information concerning identified and potential historic properties or contributing resources in the Project area. The locations of photographs were noted on maps of the Project area.

Archaeological Sensitivity Assessment

Information collected during the archival research and walkover survey was used to develop a predictive model of potential site types and their cultural and temporal affiliations. The development of predictive models for locating archaeological resources has become an increasingly important aspect of CRM planning.

The predictive model considers various criteria to rank the potential for the Project feasibility alternatives to contain terrestrial archaeological sites: proximity of recorded and documented sites, local land use history, environmental data, and existing conditions.

Pre-Contact Period Archaeological Sensitivity

Archaeologists have documented nearly 12,000 years of pre-contact Native American occupation of the region, and oral traditions of some contemporary tribes tell of a 50,000-year cultural legacy. Prior to 7,000 years ago, peoples focused primarily on inland-based resources and on hunting and collecting along the Northeast’s waterways. After 7,000 years ago, settlement became more concentrated within the region’s major river drainages. By 3,000 years ago, concurrent with a focus on coastal and riverine settlement, large populations lived in nucleated settlements and developed complex social ties, with language, kinship, ideology, and trade linking peoples across the Northeast. During the centuries before European contact, these groups began to coalesce into the peoples known as Pocumtuck, Nipmuck, Massachusetts, Wampanoag, Pokanoket, Mohegan, Pequot, and Narragansett.

Assessing the pre-contact archaeological sensitivity of any given area requires consideration of past and present geographical and ecological characteristics, known site location databases, and knowledge of distinctive temporal and cultural patterns.

The choices that pre-contact Native Americans made about where they settled, how they organized themselves, and what technologies they used were all results of the dynamic relationship between culture and environment. Predictive modeling for large-scale site location in southern New England has its roots in academic research, including Dincauze’s (1974) study of reported sites in the Boston Basin and Mulholland’s (1984) research about regional patterns of change in pre-contact southern New England. Peter Thorbahn and others (Thorbahn et al. 1980) applied ecological modeling and quantitative spatial analysis to synthesize data from several hundred sites in southeastern New England and demonstrated that the highest concentration of pre-contact sites occurred within 300 meters (m) of low-ranking streams and large wetlands. The distribution of sites found along a 14-mile I-495 highway corridor in the same area
reinforced the strong correlations between proximity to water and site locations (Thorburn 1982). These studies and other large-scale projects provided data for developing models of Native American locational and temporal land use (MHC 1982a, 1982b, 1984; RIHPC 1982) that became the foundation for site predictive modeling used during CRM surveys.

Today, assessment of archaeological sensitivity within a given area, and the sampling strategy applied to it, continues to take existing physiographic conditions into consideration but at multiple scales, from bedrock geology, to river drainages, to microenvironmental characteristics. These categories of data are used to establish the diversity of possible resources through time, the land use patterns of particular cultures, and the degree to which the landscape has been altered since being occupied (Leveillee 1999). Increasingly, social and cultural perspectives, as reflected in both the archaeological and historical records (Johnson 1999), and as expressed by representatives of existing Native American communities (Kerber 2006), are considered when assessing archaeological sensitivity. Archaeological sampling strategies have also been evaluated and refined through applications of quantitative analyses (Kintigh 1992).

Geologic data provide information about lithic resources and current and past environmental settings and climates. Bedrock geology helps to identify where pre-contact Native Americans obtained raw materials for stone tools and indicates how far from their origin lithic materials may have been transported or traded. The variety and amount of available natural resources depend on soil composition and drainage, which also play a significant role in determining wildlife habitats and forest and plant communities.

Geomorphology assists in reconstructing the paleoenvironment of an area and is particularly useful for early Holocene (PaleoIndian and Early Archaic) sites in areas that are different physically from 10,000 years ago (Simon 1991). Recent landscape changes, such as drainage impoundments for highways and railroads, the building of dams, the creation of artificial wetlands to replace wetlands affected by construction, or wetlands drained for agricultural use, can make it difficult to assess an area’s original configuration and current archaeological potential (Hasenstab 1991:57).

Beyond predicting where sites are located, archaeologists attempt to associate cultural and temporal groups with changes in the environmental settings of sites. Changes in the way pre-contact Native Americans used the landscape can be investigated through formal multivariates such as site location, intensity of land use, and specificity of land use (Nicholas 1991:76). However, distinguishing the difference between repeated short-term, roughly contemporaneous occupations and long-term settlements is difficult, and can make interpreting land use patterns and their evolution problematic (Nicholas 1991:86).

**Contact Period Archaeological Sensitivity**

The Contact Period in New England dates from about A.D. 1500 to 1650 and predates most of the permanent Euro-American settlements in the region. This period encompasses a time when Native and non-Native groups interacted with one another through trade, exploration of the coastal region, and sometimes conflict. While Contact Period sites are usually associated with Native American activity, they can also include sites such as trading posts used by Native and non-Native groups.

Native settlement patterns during the Contact Period are generally thought to follow Late Woodland traditions, but with an increased tendency toward the fortification of village settlements. Larger village settlements frequently occurred along coastal and riverine settings, often at confluences. Inland villages were focused near swamp systems, which were exploited both as resource areas and as places of refuge in the event of attack. Such sites would likely contain material remnants reflecting the dynamics of daily life, trade, and defense preparedness.
The identification of Contact Period deposits is most frequently tied to the types of artifacts located within archaeological sites. Unfortunately, the majority of the archaeological data for this period in southern New England come from the analysis of grave goods within identified Native American burial grounds, rather than from habitation sites and/or activity areas (Gibson 1980; Robinson et al. 1985; Simmons 1970). The available data suggest that sites dating to this period often contain traditionally pre-contact features and artifacts (e.g., storage pits and chipped-stone tools) and non-Native trade goods and objects (e.g., glass beads, iron kettles, and hoes) (Bragdon 1996). The earliest Contact Period sites are often located at or near the coast and estuarine margin, since Europeans travelled to New England by ship. Non-Native artifacts passed from the coastal region to the interior through trade and/or seasonal travel.

**Post-Contact Period Archaeological Sensitivity**

The landscape of a given area is used to predict the types of post-contact archaeological sites likely to be present. Major locational attributes differ according to site type. Domestic and agrarian sites (houses and farms) are characteristically located near water sources, arable lands, and transportation networks. Industrial sites (e.g., mills, tanneries, forges, and blacksmith shops) established before the late nineteenth century are typically located close to waterpower sources and transportation networks. Commercial, public, and institutional sites (e.g., stores, taverns, inns, schools, and churches) are usually near settlement concentrations with access to local and regional road systems (Ritchie et al. 1988).

Written and cartographic documents aid in determining post-contact archaeological sensitivity. Historical maps are particularly useful for locating sites in a given area, determining a period of occupation, establishing the names of past owners, and providing indications of past use(s) of the property. Town histories often provide information, including previous functions, ownership, local socioeconomic conditions, and political evolution, which is used to develop a historic context and to assess the relative significance of a post-contact site.

The written historic record, however, tends to be biased toward the representation of Euro-American cultural practices and resources, particularly those of prominent individuals and families. Archival materials generally are less sensitive to the depiction of cultural resources and activities associated with socioeconomically or politically “marginalized” communities (McGuire and Paynter 1991; Scott 1994), including, but not limited to, Native Americans, African Americans, and “middling” farming or working-class Euro-Americans. Several archaeological studies conducted throughout New England have demonstrated the methodological pitfalls of relying exclusively on documentary and cartographic materials to identify potential site locations associated with these types of communities. A large-scale archaeological study by King (1988) showed that in rural areas, only 63 percent of the sites discovered were identifiable through documentary research. This suggests that approximately one-third of New England’s rural Euro-American archaeological sites may not appear on historical maps or in town and regional histories.

Other archaeological and ethnohistoric studies in the region have focused on identifying other historically “invisible” communities, notably post-contact Native American communities. Several townwide surveys in southeastern Massachusetts have compiled archaeological and historical data about eighteenth- and nineteenth-century Native American and African American communities that are poorly represented or are altogether absent in written town histories (Herbster and Cox 2002; Herbster and Heitert 2004). In central Massachusetts, active and influential Native Americans have been identified through archival research, despite the recorded “disappearance” of this group in the early eighteenth century (Doughton 1997, 1999). The cultural continuity of groups such as the Aquinnah Wampanoag is more thoroughly documented in archival sources, but until recently, archaeologists focused their attention on pre-contact archaeological deposits. More recent studies include predictive models for distinctly Native American
post-contact sites and interpretations of eighteenth- through twentieth-century archaeological sites (Cherau 2001; Herbster and Cherau 2002).

Other archaeological investigations have focused on worker housing and landscape organization within mixed cultural mining communities in northern New England (Cherau et al. 2003); the social and spatial organization of a mixed racial community in western Connecticut (Feder 1994); and material culture and architectural patterns among nineteenth-century mixed African American and Native American households in central Massachusetts (Baron et al. 1996).

Information about post-contact land use within a given area can also be collected through written and oral histories passed through family members and descendant communities. These types of information sources can often fill gaps in the documentary record and provide details unavailable through more conventional archival sources. Although informants, other oral sources, and the documentary record can contradict each other, this type of information can also provide important data for identifying and interpreting archaeological sites. However, the sole use of and reliance on the written and oral historical records during archival research can underestimate the full range of post-contact sites in any given region. Therefore, walkover surveys and subsurface testing, in conjunction with the critical evaluation of available documentary and cartographic resources, are required to locate and identify underdocumented post-contact sites.

**Archaeological Sensitivity Ranking**

The direct Project impact areas for the Project feasibility alternatives were ranked according to the potential for the presence of archaeological resources based on information collected during the archival research and walkover survey. Table 2-1 is a summary of the factors used to develop the archaeological sensitivity rankings.

**Recommended Area of Potential Effects**

As discussed in Chapter 1, Project design plans are currently at the conceptual level. Based on the design alternatives under consideration (fish ladder or dam removal), the potential Project effects for archaeological resources are limited to direct effects that may be caused by ground-disturbing activities such as access and staging areas, dam removal, fish ladder installation, and temporary and/or permanent pond drawdown. Based on this, a potential direct Project APE for archaeological resources has been assigned that encompasses the dam and adjacent land areas and the impoundment and shorelines upstream of the dam (see Figures 1-4, 1-5, and 1-6).

The Talbot Mills Dam is within and contributes to the significance of two properties listed in the National Register of Historic Places: The North Billerica Mills Historic District (MHC Nos. BIL.O, BIL.E) in Billerica and the Middlesex Canal Historic and Archaeological District (MHC Nos. BIL.T, BIL.K, BIL.P). Both of these historic properties may be subject to effects; however, because of the conceptual nature of current project plans, the nature of Project impacts to the dam and resulting effects to the two historic properties cannot be fully anticipated at this time.

A recommended preliminary APE for direct and indirect effects to historic architectural resources is recommended that includes the dam and boundaries of the two historic districts (see Figure 5-1). These two historic properties contain hundreds of contributing resources. For clarity, the results of the survey in Chapter 5 include only discussion of the historic properties’ boundaries and contributing resources that abut or are within the viewshed of the dam and impoundment (as defined in Geotechnical Consultants, Inc. 2015: Figure 3) and thus might be anticipated to be subject to direct or indirect impacts from the
current Project alternatives. Other contributing resources of the two historic districts have not been mapped or tabulated here (see Appendix A for additional information about these resources).

Table 2-1. Archaeological Sensitivity Rankings Used for the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area.

<table>
<thead>
<tr>
<th>Presence of Sites</th>
<th>Proximity to Favorable Cultural/Environmental Characteristics</th>
<th>Degree of Disturbance</th>
<th>Sensitivity Ranking</th>
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<td>Known</td>
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Environmental features were important variables influencing pre-contact Native American and post-contact Euro-American settlement, subsistence strategies, and resources exploitation throughout New England. Natural features and resources such as bedrock geology, soil drainage, vegetation, and location relative to major drainage systems and coastal bodies all affected past human settlement location, type, and density, and the frequency of resettlement within any given geographic area. Knowledge of environmental conditions contributes to a clearer understanding of what natural resources were available to human groups and how the general Project vicinity appeared in the past. These data assist archaeologists in predicting the potential for a project area to contain cultural resources and in interpreting any identified archaeological resources.

Geomorphology and Surficial Geology

The area of northeastern Massachusetts surrounding the town of Billerica and the Talbots Mill Dam is in the physiographic zone known as the Seaboard Lowland province (Fenneman 1938; Figure 3-1). Topographic features along the middle section of the Concord River drainage in Billerica include low terraces and knolls of glacial outwash at elevations of 120 to 200 ft above mean sea level.

The bedrock geology of North Billerica and vicinity consists of the Andover granite and Salem gabbro-diorite (Clapp 1921). Andover granite, of igneous origin, underlies the greater part of northeastern Middlesex County and western Essex County and is intrusive into the Salem gabbro-diorite (Emerson 1917). Both Andover granite and Salem gabbro-diorite occur in relatively shallow deposits and are exposed on knolls and ridges near the Project area.

Bedrock formations in the region contain lithic raw materials that were utilized by Native American groups for making stone tools. Lynn volcanics, located along the northern rim of the Boston Basin, and the Newbury volcanics of northeastern Essex County were extracted and worked as early as

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Figure 3-1. Map of the physiographic regions of New England showing the approximate location of the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area.
the late PaleoIndian Period. High-grade lithic materials appearing in exposed glacial deposits in the Project area vicinity were also potential lithic sources for local chipped-stone tool industries.

Mineral deposits left behind by the Wisconsin glacier are the parent material of the soils of the region. The landscape reveals features of glacial deposition and erosion from the advance and retreat of past continental ice sheets. The direction of ice movement, as discerned from bedrock striations and drumlin orientations, was generally from northwest to southeast (USDA 2009).

As the ice progressed, it scoured the bedrock surface, leaving deepened and widened valleys. When the ice melted, it left exposed bedrock in some places in the highlands and blanketed other spots with varying thicknesses of glacial till as much as 280 ft deep. Valleys were left filled or veneered with till deposits or stratified glaciofluvial material laid down by meltwater streams. The coarsest gravel and cobbles were deposited closest to the head of the outwash, where stream velocities were greatest. The texture of deposits became progressively finer as the glacial meltwaters flowed away from the ice margin. The fluvial sequence typically ended in a glacial lake as deposits of very fine sand, silt or clay (USDA 2009).

The glacial deposits provided the parent material from which soils formed. The surficial deposits can be divided into two broad categories: glacial till and glaciofluvial deposits. Glacial till was deposited directly beneath or at the margins of the ice, or let down in place from the ice as it melted. The till is a heterogeneous mixture of boulders, cobbles, gravel, sand, silt, and clay. The predominant texture of soils formed from glacial till ranges from loamy sand to loam with various amounts of coarse fragments. The till deposits formed drumlins, ridges, or undulating ground moraine. The glaciofluvial or glacial outwash deposits (typically containing stratified sand and gravel nearly free of silt and clay) formed in stream valleys. The coarse fragments now found in the stream valleys are mostly rounded gravel and cobbles. The glaciofluvial deposits occupy such landforms as stream terraces, outwash plains, kames, eskers, and deltas (USDA 2009). Billerica lies on a glacial outwash plain dotted with drumlins (large narrow hills), kames (steep sand and gravel hillsides), and several small kettle hole ponds.

**Soils**

Soils are the product of chemical and physical weathering of geological material, including bedrock. Glacial ice picked up and ground bedrock that was then transported and deposited as a mixture of unweathered rock particles. These sediments were then separated and sorted by glacial meltwaters. Strong winds distributed fine eolian (windblown) particles over the southern New England landscape. Vegetation became established, chemical processes of weathering increased, and rock sediments developed into soils. Differences in regional soils are primarily attributed to the interaction of the five factors of soil formation: the parent material, climate, living organisms, relief, and time. Finely textured, well-drained soils were the preferred settings for Native American settlement.

Soils within the upland areas surrounding the Talbots Mill Dam and impoundment consist of excessively drained Windsor loamy sand (north and east shorelines on both sides of Faulkner Street); moderately well-drained Scituate fine sandy loam; and extremely stony (east shoreline north of Pollard Street) and somewhat excessively drained Merrimac-Urban land complex (west shoreline between Pollard and Faulkner streets) (Figure 3-2; USDA-NRCS 2015). The Concord River and impoundment upstream of the dam contain standing water; very poorly drained Saco mucky silt loam soils are mapped in the southern finger of the impoundment on the east side of the river (USDA-NRCS 2015).
Figure 3-2. Soil units upstream and downstream of the Concord River Diadromous Fish Restoration Project–Talbot Mill Dam project area (source: USDA-NRCS 2014).
Hydrology

The Talbots Mill Dam area is in the middle section of the Concord River drainage, which covers a total of 64 square miles and includes 13 major tributary streams (Figure 3-3). The Concord River is formed by the confluence of the Sudbury and Assabet rivers near Nashawtuc Hill in the town of Concord. From this point the river flows north for 16 miles through the towns of Bedford, Carlisle, Billerica, Chelmsford, Tewksbury, and Lowell. The Concord joins the Merrimack River in Lowell. On the Concord River between Egg Rock in the town of Concord and the Merrimack River confluence there are two dams: Talbot Mills Dam and Centennial Island Hydroelectric Project Dam (FERC No. 2998), both in Billerica. A third dam, the Middlesex Dam in Lowell, has been breached and only the abutments and remnants remain.

Figure 3-3. Map of the drainage basins of Massachusetts showing the location of the Concord River Diadromous Fish Restoration Project–Talbot Mill Dam project area.
CHAPTER FOUR
CULTURAL CONTEXT

To understand the history of human occupation of the Concord drainage area, it is necessary to understand the regional long-term human settlement, technology, and subsistence practices in the pre-contact through modern periods. This chapter provides an overview of the pre- and post-contact history of southern New England generally and the Talbots Mill Dam and environs specifically. The information comes from the results of professional CRM surveys, a review of state site files at the MHC, pre- and post-contact cultural histories, site-specific histories, and the collections of avocational archaeologists.

Pre-Contact and Contact Periods

Regional pre-contact Native American land use is organized by temporal periods that archaeologists use to mark changes in social organization, settlement patterns, technology, and/or subsistence practices (Table 4-1). Temporal assignments are based on radiocarbon dates derived from samples of organic materials that have been collected in association with Native American artifacts. Identified archaeological sites in the vicinity of the Talbot Mills Dam and impoundment are discussed within this framework to better understand Native American settlement of the area and to develop predictive statements about potential Native American cultural resources.

The southern end of the Merrimack River basin, formed by the combined drainages of the Assabet, Sudbury, Concord, and Shawsheen rivers, contains one of the largest inventories of known pre-contact Native American site locations in Massachusetts. This inventory is the result of intensive investigation in the area by avocational and professional archaeologists since the mid-nineteenth century. The extant body of information on pre-contact period activity (e.g., settlement and resource use) consists of three general categories of data: artifact collections assembled by avocational archaeologists; surveys and information on site locations published before about 1965; and archaeological surveys, site-specific excavations, and cultural resource management (CRM) studies conducted since 1965. The quality of the data on artifact collection provenience and the size, content, and temporal/cultural affiliation of known sites is variable.

PaleoIndian Period (12,500–10,000 B.P.)

The earliest evidence for human occupation of New England dates from the PaleoIndian Period. The retreats of the Laurentide ice sheet and the Wisconsin glacier approximately 14,000 years ago resulted in moderation of climatic conditions. The PaleoIndian Period in southern New England is characterized by low population densities, with small mobile groups of hunter-gatherers exploiting migratory game animals and seasonal plant resources (Dragoo 1976; Kelly and Todd 1988; Meltzer and Smith 1986; Ogden 1977; Snow 1980; Spiess et al. 1988; Waguespack and Surovell 2003). More recent research in the Northeast has demonstrated that PaleoIndians were likely generalized in their subsistence strategies, hunting a wide variety of animals and gathering numerous plant species (Dincauze 1990, 1993; Kuehn 1998). Similarly, Jones and Forrest (2003) have suggested that the relatively higher regional occurrence

1Dates presented in this section refer to radiocarbon years before present (B.P.), unless otherwise stated. Archaeological convention defines the “present” as 1950 A.D.
Table 4-1. Pre-Contact Native American Cultural Chronology for Southern New England.

<table>
<thead>
<tr>
<th>Period</th>
<th>Years</th>
<th>Identified Temporal</th>
<th>Cultural Aspects</th>
</tr>
</thead>
</table>
| PaleoIndian    | 12,500–10,000 B.P. | • Eastern Clovis  
• Plano                | Migratory game animals are exploited by highly mobile bands of hunter-gatherers with a specialized lithic technology.                        |
| Early Archaic  | 10,000–8000 B.P. | • Bifurcate-Base  
Point Assemblages | Few sites are known, possibly because of problems with archaeological recognition. This period represents a transition from specialized hunting strategies to the beginnings of more generalized and adaptable hunting and gathering, due in part to changing environmental circumstances. |
| Middle Archaic | 8000–5000 B.P.   | • Neville  
• Stark  
• Merrimack  
• Otter Creek  
• Vosburg | Regular harvesting of anadromous fish and various plant resources is combined with generalized hunting. Major sites are located at falls and rapids along river drainages. Ground-stone technology first used. There is a reliance on local lithic materials for a variety of bifacial and unifacial tools. |
| Late Archaic   | 5000–3000 B.P.   | • Brewerton  
• Squibnocket  
• Small Stemmed  
Point Assemblage | Intensive hunting and gathering were the rule in diverse environments. Evidence for regularized shellfish exploitation is first seen during this period. Abundant sites suggest increasing populations, with specialized adaptations to particular resource zones. Notable differences between coastal and interior assemblages are seen. |
| Transitional   | 3600–2500 B.P.   | • Atlantic  
• Watertown  
• Orient  
• Coburn | Same economy as the earlier periods, but there may have been groups migrating into New England, or local groups developing technologies strikingly different from those previously used. Trade in soapstone becomes important. Evidence for complex mortuary rituals is frequently encountered. |
| Early Woodland | 5000–1600 B.P.   | • Meadowbrook  
• Lagoon | A scarcity of sites suggests population decline. Pottery was first made. Little is known of social organization or economy, although evidence for complex mortuary rituals is present. Influences from the mid-western Adena culture are seen in some areas. |
| Middle Woodland| 1650–1000 B.P.   | • Fox Creek  
• Jack's Reef | Economy focused on coastal resources. Horticulture may have appeared late in period. Hunting and gathering were still important. Population may have increased from the previous low in the Early Woodland. Extensive interaction between groups throughout the Northeast is seen in the widespread distribution of exotic lithics and other materials. |
| Late Woodland  | 1000–450 B.P.    | • Levanna | Horticulture was established in some areas. Coastal areas seem to be preferred. Large groups sometimes lived in fortified villages and may have been organized in complicated political alliances. Some groups may still have relied solely on hunting and gathering. |
| Protohistoric and Contact | 450–300 B.P. | • Algonquian | Groups such as the Wampanoag, Narragansett, and Nipmuck were settled in the area. Political, social, and economic organizations were relatively complex and underwent rapid change during European colonization. |

1 | Termed Phases or Complexes  
2 | Before Present
of small PaleoIndian encampments compared to larger base camps may be evidence for a PaleoIndian settlement system in which mobile foragers adjusted to resource unpredictability.

Diagnostic PaleoIndian artifacts include Clovis fluted and Eden-like projectile points, with channel flakes as a diagnostic by-product of their production. Scraping tools, gravers, and drills are the other stone tools associated with this period. Many of the PaleoIndian tools recovered in the Northeast were formed from materials such as chert and flint obtained outside the region. However, lithic material types from New England, such as Saugus Jasper and Neponset Rhyolite, were also used for the manufacture of stone tools by PaleoIndian populations (Gramly and Funk 1990; Ritchie 1994).

Many larger sites in the Northeast were long-term or repeatedly used encampments (Robbins 1980). Smaller sites consisted of isolated projectile point finds, quarry workshops, habitation sites, kill-butcher sites, and tool caches. PaleoIndian sites are frequently located on stable, well-drained, and elevated glacial or early Holocene landforms, and in river valleys and on the margins of glacial lake basins (Nicholas 1988).

The PaleoIndian Period is generally underrepresented in southern New England, but several important sites have been identified in Massachusetts. Two well-documented occupations are the multicomponent encampments at the Bull Brook Site in Ipswich and PaleoIndian loci at the Neponset/Wamsutta Site in Canton. The Bull Brook Site, the largest PaleoIndian site in the region (Spiess et al. 1998), is located on an elevated terrace above the brook, dates to at least 9000 B.P., and covered several acres that have yielded thousands of artifacts, including more than 175 fluted points, scrapers, and assorted stone tools (Byers 1954; Grimes 1980; Grimes et al. 1984).

The Neponset/Wamsutta Site appears to have been a medium-sized base camp on the Neponset River containing four loci of PaleoIndian cultural material (Carty and Spiess 1992; Ritchie 1994). Text Removed - CONFIDENTIAL– NOT FOR PUBLIC DISTRIBUTION (SECTION 304 OF THE NHPA AS AMENDED, 16 U.S.C. 470W-3(a) TO (c)) and MGL C.9, S.26A(1) and 27C UNDER 950 CMR 70.13(7) One occupation (Locus D) has been radiocarbon dated to about 10,200 years ago. The assemblage of chipped-stone tools from this site included fluted points, large sidescrapers, endscrapers, gravers, and retouched flakes.

Re-examination of artifacts recovered from Wapanucket Locus #2 in Middleborough, excavated by the Massachusetts Archaeological Society (MAS) in 1953, indicates a likely early PaleoIndian occupation at this site (Bradley and Boudreau 2008). Although they are not as diagnostic as fluted points, five unifacial tools are in the collection and are more robust than fluted points and suggest an additional early PaleoIndian occupation at Wapanucket (Bradley and Boudreau 2008). Several probable PaleoIndian artifacts also have been reported from the Ponkapoag Pond Site in Canton (Bradley and Boudreau 2008; Martin 1977). Several late PaleoIndian Eden-like projectile points have been recovered from the North River Eden Site in Marshfield (Hallaren 1988), at Annasnappet Pond in Carver (Doucette and Cross 1997; Doucette 2003), and from the Titicut Site in Bridgewater (Johnson 1953).

It appears from available information that the earliest post-glacial use of the Concord River drainage by human inhabitants probably dates to ca. 11,000 B.P. Isolated finds of diagnostic PaleoIndian projectile points have been reported from several sites in the Concord River drainage, but no definite sites or components are known. A Clovis-like fluted point was found on the surface of a large multicomponent site (19-MD-77) in Bedford. Another site (19-MD-273) on a small tributary stream in Billerica has also been reported as a find spot of a PaleoIndian projectile point.
Early Archaic Period (10,000–8000 B.P.)

The Early Archaic Period is characterized by a gradually warmer and drier climate, referred to as the Hypsithermal Period. This paleoenvironment was dominated by a mixed pine and hardwood forest and would have made seasonally available food resources more predictable and abundant, allowing precontact populations to exploit a wide range of territories (Ogden 1977). Populations of megafauna began to be replaced by smaller game such as deer and bear. The lithic technology of the Early Archaic Period reflects a more diversified subsistence strategy: increased use of plant and fish resources (Robinson 1992) indicated by beaked unifacial edge tools, cores, flakes, hammerstones, milling slabs, and notched pebble sinkers. Corner-notched, stemmed, and bifurcate-base points serve as the diagnostic artifact class for this period. Characteristic of both assemblage types is the predominance of expedient tools made from local lithic sources.

Early Archaic settlement strategies remain somewhat speculative, but evidence from eastern Massachusetts river drainage studies, such as Ritchie’s review (1984) of the Sudbury and Assabet drainages, indicates that a complex multisite settlement system had been established by the Early Archaic Period, with different site locations indicating exploitation of varied resources and environmental settings (Johnson 1993; Ritchie 1984). Early Archaic groups continued to generalize in their subsistence base, hunting available game and harvesting available woodland and wetland vegetation and nuts (Dumont 1981; Forrest 1999; Kuehn 1998; Meltzer and Smith 1986; Nicholas 1987). Populations most likely increased, although known sites are poorly represented in the archaeological record. The nearly exclusive use of local stone for tool production also suggests a more settled lifestyle.

Identifying Early Archaic archaeological deposits in southern New England has typically relied on the recovery of bifurcate-base lithic projectile points. Concentrations of these points have been identified around the perimeters of ponds, marshes, and wooded wetlands and at the headwaters of major rivers in southeastern Massachusetts (Taylor 1976) and Connecticut (Pfeiffer 1986). Low-density recoveries of bifurcate-base points have also been reported from similar environmental settings in Rhode Island. Other lithics associated with the Early Archaic Period include beaked unifacial edge tools, cores, flakes, hammerstones, milling slabs, and notched pebble sinkers, indicating increased use of plant and fish resources (Robinson 1992).

Early Archaic diagnostic projectile points have been collected from approximately 15–20 multicomponent Archaic/Woodland Period sites on the combined Concord/Sudbury drainage. An isolated find spot (19-ES-219) of an Early Archaic bifurcate-base projectile point was located on an upper level terrace above the Merrimack River (Barber 1979). Most sites in the area have no definite Early Archaic components. The locations of these finds seem to indicate that some kind of regular, perhaps seasonally based settlement patterns were in place by 8500–8000 B.P. (Ritchie 1984). The Heath Brook Site (19-MD-22) in Tewksbury appears to be the only exception to this pattern; data recovery investigations identified a deep pit feature that yielded a bifurcate-base projectile point. Two radiocarbon dates (8360 ± 80 B.P. and 8460 ± 60 B.P.) also support an Early Archaic occupation at the Heath Brook Site (Glover and Doucette 1992).

Middle Archaic Period (8000–5000 B.P.)

The distribution and somewhat higher density of Middle Archaic sites in southeastern New England indicate that a multisite seasonal settlement system was firmly established. The distribution of Middle Archaic components in a variety of riverine and upland environmental settings indicates a fairly intricate settlement pattern with varying site size, function, and internal complexity. Large base camps, usually located near riverine wetlands, appear to have been used repeatedly over a number of generations (Doucette and Cross 1997; Jones 1999).
Sites from this period also appear to cluster around falls and rapids along major river drainages in New England, where the harvesting of anadromous fish and various flora resources was combined with generalized hunting practices (Bunker 1992; Dincauze 1976; Doucette and Cross 1997; Fowler 1968, 1975; Maymon and Bolian 1992). The seasonal pursuit of anadromous fish species may have developed in response to the development of socioeconomic territories defined by major river drainage basins (Dincauze and Mulholland 1977). Climatic and biotic changes continued, and deciduous forests of oak, beech, sugar maple, elm, ash, hemlock, and white pine began to emerge. The present-day seasonal migratory patterns of many bird and fish species had become established (Dincauze 1974), and important coastal estuaries had developed (Barber 1979).

Neville, Neville- Variant, and Stark stemmed projectile points, semilunar knives, and bifacial preforms mark the Middle Archaic Period in southern New England (Dincauze and Mulholland 1977; MHC 1984; Ritchie 1979). Ground-stone technology introduced a variety of tool types in the lithic assemblage, including net sinkers, plummets, grooved adzes, axes, gouges, whetstones, and atlatl weights (Carlson 1964; Dincauze 1976; Fowler 1950). Excavations at Annasnappet Pond in Carver, Massachusetts, have conclusively linked the emergence of atlatl weights to this period (Cross 1999; Doucette and Cross 1997). The presence of adzes, gouges, and axes suggests heavy woodworking and possibly the use of dugout canoes.

A preference for locally available lithic raw materials for a variety of bifacial and unifacial stone tools is also evident at many Middle Archaic sites in Massachusetts. Local lithics from the Westborough formation, including quartzite or mylonite, and rhyolite from sources in the Blue Hills and Charles- Neponset River drainage area, were used to make Neville points. Stark points were primarily chipped from distinctly local lithic materials such as quartzite, crystal tuff, and amphibolite schist, or argillite from source areas in the Charles River drainage. Local quartzite, mylonite, crystal tuff, and amphibolite schist were quarried from bedrock outcrops in upland sections of the Sudbury/ Assabet drainage (Ritchie 1979). Quartzite, available as riverine and glacial cobbles in many parts of Massachusetts, was used for chipped stone tools.

Investigations at the Heath Brook Site in Tewksbury (Shawsheen River) yielded Middle Archaic Stark projectile points and drills in connection with living surfaces and a lithic workshop. A fire-related pit feature associated with the lithic workshop produced a 5130 ± 70 B.P. radiocarbon date. Data collected at the Heath Brook Site implies that pre-contact populations used this site for a variety of domestic subsistence-related activities (food procurement/ processing and storage/disposal and stone toolmaking) during the Middle Archaic Period (Glover and Doucette 1992). Another nearby site, Pine Ridge Cemetery, also contained a Middle Archaic component (Stark complex) and forms part of the cluster of sites in the Shawsheen drainage. One site on Cold Spring Brook in Chelmsford also contained a Middle Archaic component with diagnostic Stark-like projectile points.

Late Archaic Period (5000–3000 B.P.)

The Late Archaic Period was marked by a climatic shift to drier and slightly warmer conditions with a significant decrease in precipitation. Oak, pine, and beech reached their full extent, and wetlands became more abundant along river margins. Wetland and estuarine areas appear to have been used extensively based on site distribution. The increase in density of sites and artifacts from this period in southern New England coincides with this climatic warming (Funk 1972). Archaeological evidence demonstrates an increased use of shellfish and nuts and the construction of fish weirs, such as the Boylston Street Fishweir in Boston. Perhaps in response to an increasingly resource-rich natural environment, Late Archaic populations expanded and diversified.
Chapter Four

The Late Archaic Period is grouped into three major cultural traditions (Laurentian, Small Stemmed, and Susquehanna), which mark a temporal and cultural transition to the Transitional Archaic Period (discussed below). The Small Stemmed and the Susquehanna traditions overlap with the Woodland Period. The Laurentian Tradition is the earliest phase of Late Archaic activity in the region and is marked by Vosburg, Otter Creek, Brewerton, and Broad Eared projectile point types. These points are manufactured primarily from locally available materials such as quartzite and rhyolite. Site distributions from the Laurentian Tradition appear to be oriented to the central uplands region, suggesting a primarily interior, riverine adaptation (Dincauze 1974; Ritchie 1971).

Despite recent revisions of the diagnostic value of Small Stemmed projectile point types, the Small Stemmed Tradition continues to be an accepted Late Archaic cultural affiliation, although the duration of the tradition has been extended into the Woodland Period in some areas (Mahlstedt 1985; Rainey and Cox 1995; Wamsley 1984) and may be a regional development of the Middle Archaic Neville/Stark/Merrimack sequence (Dincauze 1976; McBride 1984a). Small Stemmed and Small Triangular (Squibnocket) point types are characteristically associated with a quartz cobble technological industry (McBride 1984b) and are equally dominant in artifact collections and excavated sites. Lamoka and Bare Island points are also associated with the Small Stemmed Tradition, which exploited a wide range of ecozones, including coastal and riverine settings and upland areas.

Known sites with Late Archaic components range from the large, multicomponent Call Site (riverine base camp/fishing station) in North Billerica to other smaller loci that were probably temporary camps. In Chelmsford, at least six sites near tributary streams or associated wetlands (Cold Spring Brook, Dunns Berry Patch, Edward Stearn, Peat Bog, and River Meadow Brook sites) are reported to have Late Archaic components. Some of these sites likely contain Small Stemmed Tradition depositions; however, specific information on cultural components is very limited. A cache of 112 stemmed projectile points found in Billerica in 1924 includes some points that appear to be Late Archaic types (Susquehanna Tradition) (MHC site files). The Call Site in North Billerica contained a cremation burial pit feature belonging to the Susquehanna Tradition (Atlantic phase), dating to about 3,900–3,600 years ago. Burned projectile points (Atlantic), other stone tools, and calcined bone fragments were recovered from this feature (Dincauze 1968).

Transitional Archaic Period (3600–2500 B.P.)

The Transitional Archaic Period marks the interim between the Archaic and Woodland periods and represents a time of changing cultural dynamics. Cultural identifiers include the presence of ocher deposits and steatite (soapstone) vessels. Susquehanna Tradition sites from this period are best known from cremation cemetery complexes and ceremonial sites in the coastal zone of New England (Dincauze 1968; Leveillee 1998). Atlantic, Wayland Notched, Snook Kill, and Susquehanna Broad projectile points and several varieties of bifacial blades are associated with this tradition. Susquehanna materials were commonly manufactured from a variety of lithics, including local quartzite, eastern volcanics, and exotic non-local cherts. There was a noticeable preference for non-locally available raw materials for the manufacture of these tool types during the earliest phases of the Susquehanna Tradition, with increasing reliance on local materials by the final Orient Phase.

Other artifacts diagnostic of the Transitional Archaic Period are Genesee, Normanskill, Wayland Notched, and Orient Fishtail projectile points and the presence of steatite. The quarrying of steatite and the manufacture of steatite vessels were important technological developments associated with this tradition. Carved steatite vessels reflect increased sedentism because of the low transportability of these items. Regionally available steatite outcrops include the Dolly Bond Quarry and the Horne Hill Quarry in Millbury and others in western Massachusetts and northern Rhode Island where Orient projectile points were recovered (Fowler 1966).
Cultural Context

Steatite vessel forms, such as bowls and later smoking pipes, were used domestically, ceremonially, and as trade items. A distinctive lithic flaking technology and a new class of diagnostic tool forms were also developed by the local populations or were introduced by new groups migrating into the New England area. Projectile points and tools from the Susquehanna Tradition are commonly found on multicomponent sites and are often associated with Small Stemmed Tradition materials (although not in mortuary settings).

Evidence for complex mortuary ritual is frequently encountered at regional ceremonial sites such as the red ocher cremation interments at the Watertown Arsenal Site in Watertown and at the Millbury III Site in Millbury. Radiocarbon dates associated with the Millbury III burials place the Susquehanna components between 3610 ± 90 and 2870 ± 50 years B.P. (Leveillee 1998). Grooved axes, cruciform drills, pestles, a copper blade, and Susquehanna and Watertown variety projectile points were all included with these burials. Cremation burials are also reported from the Mansion Inn and Vincent sites in Middlesex County, from the Coburn Site in East Orleans, and elsewhere in the region (Dincauze 1968). A Transitional Archaic Susquehanna Tradition site also was identified in Charlestown during the archaeological investigations of the northern Central Artery (Pendery et al. 1982).

**Early Woodland Period (3000–1600 B.P.)**

The Early Woodland Period is generally underrepresented in the archaeological record of southern New England. Some archaeologists have suggested that a population decline occurred in the region during this period that was associated with unfavorable environmental conditions and unknown epidemics (Dincauze 1974; Fiedel 2000; Lavin 1988; Mulholland 1988; Snow 1981; Wendland and Bryson 1974). However, the low representation of sites actually may be a lack of recognition of Early Woodland cultural material components because of overlapping (Small Stemmed and Susquehanna traditions) and/or poorly documented tool assemblages. Given the problems inherent in using only one artifact type as a temporal indicator, the presence of early ceramics in conjunction with point types is used to determine Early Woodland occupation in the absence of radiocarbon dates.

Coastal resources are believed to have become an important part of subsistence collecting activities and diets, as evidenced by the higher frequency of known Early Woodland coastal sites in New England (Cox 1983; Cox et al. 1983; Kerber 1983; Thorbahn and Cox 1988). It was a time of widespread long-distance exchange of raw materials, finished products, and information (MHC 1984), and of possible task-specific sites (Dincauze 1976). Ceramic technology, known as Vinette I, replaced the soapstone vessels used during the Transitional Archaic Period. Early Woodland diagnostic materials include stemmed and side-notched Adena, Lagoon, Rossville, and Meadowood projectile points. Early Woodland artifact assemblages also comprise a high percentage of exotic lithic materials that represent an expansion and elaboration of long-distance trade networks.

Many of the riverine zone site locations like the Call Site with Late Archaic components were also used by Transitional Archaic and Early Woodland hunter-gatherers. Large multicomponent sites in the upper Concord River drainage have yielded Terminal Archaic (Orient Fishtail and various Small Stemmed points) and Early Woodland (Meadowood) projectile points. Comparable data are not available for the lower Concord drainage, although a few sites (Call and Cold Spring Brook sites) seem to fit this general pattern. An Early Woodland component reported on the Robbins Hill Site in Chelmsford may be a relatively rare upland zone site from this time period.

**Middle Woodland Period (1650–1000 B.P.)**

During the Middle Woodland Period, population increased and extensive long-distance social and economic interaction became established. Larger base camps in riverine and coastal settings reflected
ever-increasing sedentism with increased instances of storage pit features suggesting production of bulky foods. Horticulture began to supplement the traditional hunting and gathering practices in the Northeast. It led to changes in subsistence, population growth, organization of labor, and social stratification (Snow 1980). The degree of dependence on horticulture and its significance as a stimulus of social and economic change in the late pre-contact history of southern New England is a topic of ongoing archaeological research (Mrozowski 1993; Chilton 2010).

Changes in settlement and subsistence strategies during the Middle to Late Woodland transition may have occurred independently of the adoption of horticulture (McBride and Dewar 1987). Studies have shown that components from this transition are marked by a high percentage of exotic lithics. Diagnostic Fox Creek and Jack’s Reef projectile points are found with Pennsylvania jasper, assorted New York State cherts, Ramah chert (Labrador), Kineo felsite (Maine), and Lockatong argillite (northern Mid-Atlantic region) (Goodby 1988; Luedtke 1987; Mahlstedt 1985). This assemblage of exotic raw materials suggests that Middle Woodland populations in southern New England took part in an extensive network of social and economic contacts that extended from Pennsylvania northward to Labrador (Dragoo 1976; Fitting 1978; Snow 1980). A high occurrence of locally available hornfels from the Blue Hills area south of Boston also marks the period (Luedtke 1987; Ritchie and Gould 1985). Pottery became increasingly stylistically diverse, including grit-tempered coil-built vessels with stamped, incised, and dentate decoration of varying quality.

Site examination investigations of the Heath Brook Site identified a large pit feature that dated to the Middle Woodland (1310 ± 50 B.P.) Period. The Middle Woodland component is also supported by the presence of a Jack’s Reef projectile point in the general vicinity of the pit feature (Glover and Doucette 1992). Evidence of Middle Woodland activity in upland environmental zones in the middle Concord drainage is limited; however, a few sites along the margin of the Concord and Shawsheen drainages in Billerica have yielded new information. These sites range in size from about 65 to 900 square meters and contain varying densities of cultural material (chipped-stone tools and chipping debris) and features (small hearths and burnt rock pavement). Radiocarbon dates from several features range from 2100 ± 60–120 B.P., indicating occupation during the Early to Middle Woodland periods (Mulholland and Stillson 1988).

**Late Woodland Period (1000–450 B.P.)**

The Late Woodland Period is marked by an increase in ceramic production through improvements in tempering and firing technology. Some populations may still have relied solely on hunting and gathering, while others turned to horticulture. Coastal areas and large semipermanent village settlements adjacent to arable lands, particularly along broad floodplains, were preferred (Bendremer 1993; Bendremer and Dewar 1993). Farming, however, did not preclude the continuance of seasonal rounds, and small task-specific camps were still common. Social complexity, the formation of political alliances, and the establishment of tribal territories developed. Larger groups sometimes lived in fortified villages, indicating the presence of complicated political alliances (Mulholland 1988).

Late Woodland artifacts include triangular Levanna and Madison points; cord-wrapped, stick-impressed, and incised collared ceramic vessels; and increasing amounts of local lithic materials (MHC 1984). Diagnostic Levanna projectile points were most often manufactured of quartz, argillite, and rhyolites derived from the Lynn Volcanic Suite and in the Blue Hills of northeastern Massachusetts and the Boston Basin, or of coastal cobbles. This reliance on locally available lithic materials suggests the formation of the ancestral tribal territories noted at the time of European contact.

Many riverine zone site locations selected by previous Archaic cultural groups were reutilized during the Middle and Late Woodland periods. An example of this is the Call Site in North Billerica, where evidence
of Middle and Late Woodland components (Levanna points and ceramic sherds) was found by local amateur archaeologists. Known Middle Woodland components in the upper Concord River drainage are mostly restricted to the riverine zone and include the Punkatasset Field (19-MD-81), Poplar Hill (19-MD-88), and Old Manse (19-MD-89) sites in Concord. One of the few known Woodland Period sites along the Billerica section of the Concord River is 19-MD-443, where ceramic sherds were found. Some of the Middle to Late Woodland components on large riverine zone sites in the southern Merrimack River basin have contained burnt rock features and were probably constructed for smoking and drying fish during seasonal runs of anadromous species (Blancke 1978; Luedtke 1985). The Locke Road Site (19-MD-338) in South Billerica may have been another small upland zone camp used during the Late Woodland Period (MHC site files).

**Contact Period (450–300 B.P./A.D. 1500–1650)**

The traditional cultural systems of Native Americans were rapidly transformed during the Contact Period. Contact with European populations slowly but completely disrupted Native American lifeways, including their social, economic, and political cultures. The lifeways of the Contact Period Native populations are believed to have been similar to those of the Late Woodland Period, with large permanent base camps and villages (some fortified) and smaller satellite hunting and fishing camps. Large groups may have gathered at certain times of the year for resources exploitation and social and ceremonial functions.

Early ethnohistorical documents and modern ethnohistorical sources attest to the extensive trade network in place (Bragdon 1996; Brasser 1978; Snow 1980; Winthrop 1996). Fur trade was an important economic factor for Europeans and Natives alike, and in return for furs the Native Americans received clothing, food items, metal, and beads. Interaction between Native peoples and Europeans is recorded in the writings of several early explorers and settlers, including John Winthrop, William Bradford, Thomas Morton, Samuel Champlain, and Samuel and John Smith. European trade goods circulated to Native populations, especially during the early seventeenth century. Although pre-contact trade routes may not have been used throughout the Late Woodland Period (McBride and Dewar 1987), they clearly served as conduits for distributing European goods, especially marine shell beads (wampum), by the early seventeenth century.

Disease and warfare decimated populations and dispersed survivors throughout the region; a major epidemic in 1616–1617 drastically reduced Native populations. Smallpox and measles had a devastating effect on the Native Americans in the region. In the early 1630s, smallpox almost annihilated the Native population around Boston Bay, although many in the interior survived to help form the villages of the Christianized “Praying Indians,” which existed for many years at Natick, Nonantum, Punkapog, Hassanamesitt, and Magunco to the south and west of Boston (Cook 1976). Several Contact Period burials uncovered on Hough’s Neck in Quincy and in Squantum may date to these widespread plagues in 1612–1613 and 1616–1617 that decimated the Native American population in eastern Massachusetts (Dincauze 1974). The declining number of Massachusetts Native Americans was suggested by Gookin in 1772, who said “there are not of this people left at this day above 300 men, besides women and children” (Gookin 1772).

King Philip’s War (1675–1676) resulted in the military defeat and geographic dispersal of Native groups in southern New England, particularly the Pokanoket and Narragansett, and the virtual destruction of European allies, including the Nipmuck “Praying Indians.” Similar conflicts in northern New England continued well into the eighteenth century, with similar results. By the mid-1600s, there were few Native peoples alive in the region, but they were not “wiped out” and continued to maintain distinct cultural traditions.
Chapter Four

The Concord and Shawsheen river drainages were occupied by Native populations associated with the Pawtucket and Nipmuck tribes during the Contact Period. Native American settlements were reported along the Concord River and the north side of Nutting Lake (MHC 1980). The Concord and Shawsheen river drainages were travelled via a well-established network of trails that provided access between the core settlement areas. Subsistence patterns were greatly influenced by the seasonal availability of food resources, including major anadromous fish runs. Additional resources available to Native populations included freshwater fishing in Nutting Lake, good agricultural land, and the potential for upland and lowland hunting and gathering. Native settlement in the Billerica area persisted through the seventeenth century. An undated (ca. 1660s) map shows “Indian Towne,” a possible palisaded village lying east of the Shawsheen River (MHC 1980).

Post-Contact Period

An understanding of European exploration, settlement, and development in the town of Billerica and throughout Massachusetts and provides a context in which to assess the post-contact archaeological sensitivity and potential archaeological resources in the Project area. Table 4-2 provides a summary of the Post-Contact Period in Massachusetts.

Plantation Period (A.D. 1620–1675)

The lands lying between the Concord and Shawsheen rivers, referred to by the Native American inhabitants as Shawshine, were first granted to EuroAmerican settlers ca. 1637. The general court granted some of the lands to Cambridge in 1641 with the stipulation that “they would make it a village to have ten families settled there within ten years” (Barber 1839:349). However, it appears that the first settlement was not made in the area until 1653. Among the first settlers, from Cambridge and from England, were Simon Crosby, Jonathan Danforth, George Farley, Edward Farmer, William French, Ralph Hill, John Kittredge, Samuel Manning, John Parker, Thomas Richardson, John Rogers, Joseph Thompson, and Rev. Samuel Whiting. Initial settlement consisted of dispersed farms in two areas. The town grant, Billerica Center, was settled primarily by persons from Cambridge. The Dudley Farm, south of the town grant along the Concord River and Concord Road, drew most of its residents from Woburn (Hazen 1883).

A committee was selected and the town lands were divided into five and ten acre lots by Capt. Jonathan Danforth. A single share or ten acre lot consisted of approximately 113 acres of upland and 12 acres of meadow (Barber 1839:349). By the end of the period the population of Billerica had increased from the original nine families in 1654 to about 50 families. The first meetinghouse was built by John Parker ca. 1660. Native trails following the valleys of the Concord and Shawsheen rivers were used as highways. The ford over the Concord River in North Billerica was replaced by a bridge during the 1650s. Agricultural pursuits, including reliance on the meadow along the Concord River, formed the basis for the economy. Seasonal fishing, lumbering, and fur trading also contributed to the economy. John Parker's mill began operating ca. 1660. By 1672 Simon Crosbee had opened a tavern (Hazen 1883; MHC 1980).

Colonial Period (1675–1775)

Billerica's population grew slowly during the Colonial Period, from an estimated 401 residents in 1688 to 769 in 1707. The slow rate of growth was due in large part to frontier warfare. No damage occurred during King Philip’s War. In 1692, and again in 1695, Billerica suffered Indian raids as part of the ongoing French and Indian War (ca. 1690–1763). On August 5, 1695, Indians attacked the homes of John Rogers, John Levistone, and Dr. Roger Toothaker. Fifteen residents were killed or captured. Growth increased during the later portion of this period after the division of common lands in 1708 and the end of Queen Anne's War in 1714. A total of 1,252 persons lived in the town in 1733. The 1765 census reported
### Table 4-2. Post-Contact Euro-American Cultural Chronology for Middlesex County, Massachusetts.

<table>
<thead>
<tr>
<th>General Period</th>
<th>Cultural Aspects/Diagnostic Cultural Material</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contact &amp; Plantation</strong> 1500—1675</td>
<td>Initial European exploration and contact with Native American population. Native crops were established along major river drainages (e.g., Concord, Assabet, Sudbury, and Charles), connected by extensive overland trail systems. Major trade networks intersected at confluences of Concord and Sudbury (Concord) and Charles and Sudbury (Lincoln) rivers, with branches extending in many directions. Local rivers provided seasonal fishing, diverse terrains for hunting, gathering, and cultural opportunities for the care of aboriginal settlements in the area. Extensive immigration of Puritan settlers newly established permanent settlements beginning with coastal towns. Middlesex County was established in 1643. By 1675, seventeen towns had been established within the county: Charlestown, Malden, and Watertown (1630); Concord (1635); Cambridge (1636); Sudbury (1639); Waltham (1642); Reading (1644); Malden (1645); Woburn (1650); Billerica, Chelmsford, and Groton (1651); Marlborough (1660); Dunstable (1673); Shirley (1674); and Falmouth (1675). Increasing interaction introduced European sensibilities and material culture among native cultural practices, and ended transient encroachments and raids. Agriculture, seasonal fishing, and small-scale industry formed the basis of colonial economy. Waterways and native trails provided major transportation routes. Colonial settlement patterns expanded from concentrated to more widespread dispersed areas and farms. Majorized, early thin-glass sherds; Rhenish and Bellarmine storewares; predominate ceramic assemblage. Pipestems with mean bore diameter of 7.0–7.5 mm. Hand-hewn nails only. Freeblown glass bottles; pontil scar on mold mark.</td>
</tr>
<tr>
<td><strong>Colonial</strong> 1675—1775</td>
<td>European settlement and expansion in area virtually unaffected by King Philip's War (1675–76). Continued. Agriculture and raw material collection remains principal economic activity in the area. Industrial pursuits, including grist, saw, and fulling mills, and shipyard works, processed and produced goods for local consumption. Twenty new towns were established: Stow (1637); Roxbury (1631); Dracut (1702); Lexington and Weston (1713); Hopkinton and H. Patent (1715); Holliston (1723); Stoneham (1725); Bedford and Westford (1729); Milford (1730); Tewksbury (1732); Andover (1735); Waltham (1736); Pepperell and Shirley (1735); Lincoln (1754); and Ashby (1767). Cambridge, Charlestown, and Concord developed into regional centers. Massachusetts colonies, angered by British economic restrictions (e.g., Stamp Act 1767, Townshend Acts 1767), rebelled in Boston Massacre (1770), Boston Tea Party (1773), and finally started fighting at Lexington and Concord (April 19, 1775). Imported thin-glass sherds; white salt-glaze, English brown, Westerwald and scratch-blue storewares, imported and domestic redware. Mean pipestem bore diameter of 4–6.4 mm. Hand-thrown: nails only. Freeblown and molded glass bottles.</td>
</tr>
<tr>
<td><strong>Federal</strong> 1788—1810</td>
<td>Following the Peace of Paris (1783) ending Revolutionary War, the population of Middlesex County grew steadily, increasing from 45,737 inhabitants in 1790 to 77,976 in 1810. Nine new towns were established: Chelmsford and East Sudbury (1780); Boxborough (1782); Tewksbury (1782); Burlington (1789); Newton (1790); South Reading (1812); and Lowell (1856). The economic base of many of the towns remained primarily agricultural, with an emphasis on corn, flax, hay, and livestock. Industries included grist mills, lumbering and saw mills, quarrying, ceramic and glass manufacturing, and brick and slate manufacture. Colonial highways remain, with improvements in form of Cambridge (Route 2A) and Concord (Route 2) turnpikes. The Middlesex Canal (1795–1801) and the Middlesex Turnpike (1806) were built to carry raw materials (e.g., granite, lumber, hog iron) to agricultural products from New Hampshire and northern Middlesex County to Boston. Creamware and pearlware preconure ceramic assemblage. Hand-painted and transfer print decorated, small bore diameter (4.64 in.). Pipestems. Both hand-hewn and machine cut nails. Post 1810 3-ply, 5-ply, and double walled nails introduced. First trains (post 1819).</td>
</tr>
</tbody>
</table>

* Source: VHC 1986a, 1986b, 1986c; Guzzi 1975*
Table 4-2 (cont’d). Post-Contact Euro-American Cultural Chronology for Middlesex County, Massachusetts.

<table>
<thead>
<tr>
<th>General Period</th>
<th>Cultural Aspects/Diagnostic Cultural Material</th>
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<tbody>
<tr>
<td><strong>Early Industrial</strong></td>
<td>Introduction of railroads revolutionized the regional transportation network. With the arrival of the railroad came new products solely for local markets to exportation of these products to other markets. Milk, market gardening, and fruit production (e.g., Concord grape developed in Concord) were the major agricultural products exported. Industrial Revolution also affected manufacturing. Population of Middlesex County more than doubled, reaching 274,323 in 1870. Eleven new towns established: Wayland (1835); Somerville (1842); Ashland (1846); Melrose and Winchester (1850); North Reading (1853); Belmont (1859); Hudson (1866); Arlington (1867); Wakefield (1868); and Everett (1870). Lowell developed a major mill town and center of industrial development, becoming a city in 1836. Cambridge was incorporated as a city in 1846. Concord developed as a literary retreat for several prominent writers and transcendentalists (Emerson, Thoreau, Hawthorne, Alcott, etc.) beginning in the 1830s.</td>
</tr>
<tr>
<td><strong>Late Industrial</strong></td>
<td>Technological developments resulted in major changes (e.g., steam power, electrification, gas lighting, etc.). Development of urban and interurban mass transportation, street railways (i.e., streetcar routes in Concord and Lexington by early 1900s). Country estates and some suburban development began in many towns by the end of this period. Industrial expansion continued in Lowell. Arrival of large numbers of immigrants, especially from Ireland, Italy, Norway, and Nova Scotia. The county's population more than doubled between 1880 (317,830) and 1910 (669,915). The towns of Ayer and Maynard were established in 1871. Somerville (1871) and Everett (1892) were incorporated as cities, while in 1873 Brighton and Charlestown became part of Boston. Market gardening and greenhouses formed an important part of the economy of Concord, Lexington, and Lincoln. Hard white earthenware predominates ceramic assemblage with yellowware and domestic stoneware. Machine-made bottles most common. Semi-automatic bottling machine (post 1881); replaced by fully automatic machine-made bottles (post 1903). Hutchinson stopper (post 1872/9); canning jar closure (post 1875); crown bottle cap (post 1892). 1904 double-seamed tin can can be introduced.</td>
</tr>
<tr>
<td><strong>Modern</strong></td>
<td>Introduction of automobile and major improvements in automobile transportation network (e.g., Routes 2, 2A, 3, 3A, 117, 126, 128/1-95, 1-93, and I-495). Development, both commercial and residential, along improved transportation corridors. Bedford Airport (Hanscom Air Force Base) created in 1940s with growth of associated industrial zone. Growth of new industries, including computer technology. Agriculture remains important in economy of some towns, with market gardens and dairies shipping produce to urban areas. The population of Middlesex County increased steadily from 1910 to 1970 (1,398,397), then declined slightly in 1980 (1,367,034). Hard white earthenware, stoneware, porcelains, and melamine (post WWII). All bottles fully automatic machine-made. Purple manganese glass. Beer can introduced 1935. Pull-tab can opening introduced 1962. Plastic products (post 1900).</td>
</tr>
</tbody>
</table>
1,334 persons, with 223 families and 189 houses in the town (MHC 1980). Lands for three new towns were taken from Billerica during the Colonial Period.

Settlement remained dispersed, with minor focal points at the village center and around mills. Secondary highways were established to supplement the seventeenth-century road network, which included Rangeway Road to Carlisle in 1708, High and Pond streets to Tewksbury, and the Salem and Lexington roads. Two bridges were constructed over the Concord River during the 1730s at River and Bridge streets. Agriculture, grazing, dairy, and orchards continued to form the base of the town’s economy. Lumbering and milling increased in importance through the period. Several mills were built, including Hill’s on Content Brook ca. 1680; Osgood’s saw and gristmill on the Concord River in 1708, to which a fulling mill was added in 1747; and William French’s sawmill on Content Brook in 1764. In 1711, a dam was placed across the Concord River in North Billerica. Industry remained concentrated in this section of the town through the nineteenth century (Hazen 1883; MHC 1980).

**Federal Period (1775–1830)**

During the Federal Period, the town's population increased with minor fluctuations, after an initial decline. The creation of the district of Carlisle in 1780 resulted in the annexation of lands from Billerica and a decrease in population (Figure 4-1). The first federal census in 1790 recorded 1,191 residents in the town. By 1830, some 1,368 persons were living in Billerica. The existing eighteenth-century road network remained in use with some improvements, including Nashua Road (Route 4). The Middlesex Canal (1795–1801) and the Middlesex Turnpike (1806) were designed to carry raw materials (granite, lumber, bog iron, agricultural produce, etc.) from New Hampshire and northern Middlesex County into Boston. They served to improve the transportation network linking New Hampshire and Boston and placed Billerica on these major routes. The canal, which went through the northern and eastern portions of the town, crossed both the Concord and Shawsheen rivers via stone aqueducts. The turnpike route roughly followed the Concord River through Billerica (Barber 1839; Hazen 1883; MHC 1980).

Much of the town's population continued to live in dispersed farms and small settlements and the economy continued to be tied to agriculture through the Federal Period. A village formed at the town center. Clusters of houses were built at North Billerica, along Pollard Street and on Salem Road. The opening of a stageline ca. 1795 spurred the opening of two or three taverns in the center village (Hazen 1883). A few small mills continued to process grain and lumber. A woolen mill was established in North Billerica by Francis Faulkner in 1811. Population increased from 1,368 in 1830 to 1,833 in 1870. Settlement within the town continued to focus on the center village, which expanded along the major roads during the Early Industrial Period. A village was formed at North Billerica, and a small group of homes were built at East Billerica (Pattenville) (MHC 1980). Homes, schools, churches, and several stores were built at each of these settlements. In general, Billerica remained primarily a rural agricultural area on the expanding Lowell industrial core through the nineteenth century.

**Early Industrial Period (1830–1870)**

By 1835, the Lowell Railroad had been built through East and North Billerica, paralleling the Middlesex Canal and providing a link between Boston and Lowell (Figures 4-2 and 4-3). The canal, which could not successfully compete with the railroad, ceased operation by the mid-nineteenth century. The proximity of Billerica to the developing textile industries in Lowell may have influenced the industrial development of the town during the Early Industrial Period. In 1839, the Talbot Dyewood Mill was established in North Billerica. In 1837, the town contained two woolen mills, which employed about 40 men and women, and had four sets of machinery that produced 96,319 yards of cloth valued at $32,561. In addition, 512 pairs of boots and 19,336 pairs of shoes, valued at $11,093, were manufactured (Barber 1839). The Talbot
Figure 4-1. 1794 map of Billerica showing the approximate location of the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area (source: Whiting 1794).
Figure 4-2. 1831 map of Billerica showing the approximate location of the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area (source: Hales 1831).
Figure 4-3. 1853 map of Billerica showing the approximate location of the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area (source: Walling 1853).
Woolen Mill was built opposite Faulkner's Mill in 1857. Jaquith Bros. operated a glue factory in the town after 1867. An internationally known patented machine for splitting leather was manufactured at the Hill Machine Shop in Billerica (Hazen 1883; MHC 1980).

Late Industrial Period (1870–1915)

Billerica's population increased steadily from 1,527 in 1840 to 2,775 persons in 1910. Foreign-born residents, primarily from Ireland and England, formed approximately one-quarter of the town's population during the Late Industrial Period. Billerica, like other Middlesex County towns (Bedford, Burlington, Chelmsford, etc.) formed a portion of the suburban and rural peripheries of the expanding Boston and Lowell urban cores. Billerica Center continued to expand with new construction on the peripheries (MHC 1980). North Billerica developed as a major focus of settlement (Figure 4-4). No new industries developed, but existing mills expanded at North Billerica (Figure 4-5). Agriculture continued to contribute significantly to the town's economy. Shipment of market garden produce to Lowell and Boston increased in importance during the period (MHC 1980). The transportation network linking Billerica to Lowell and Boston was improved. A secondary branch railroad was constructed from North Billerica to Bedford in 1877. Street railway routes were built during the early 1900s from suburban Boston to Lowell following Concord and Boston Roads through North Billerica (MHC 1980).

Modern Period (1915–Present)

The town's population grew steadily from 3,646 in 1920 to 17,867 in 1960. The opening of the County House of Correction ca. 1935 was responsible for a slight population increase. Billerica experienced a period of rapid population growth during the 1960s, with the population nearly doubling by 1970. Population increase slowed during the next decade, increasing from 31,648 in 1970 to 36,727 in 1980. Rapid economic growth and expansion of the urban Boston core and suburban periphery is reflected in the population growth since the 1960s. Street railways built during the first decade of the twentieth century were abandoned in the 1920s. Automobiles and improved highways, including Boston Road (Route 3A) and Salem-Chelmsford Road (Route 129), replaced the street railways. Improvements to the road network continued after World War II with the construction of Routes 3 (1953), 128, and I-93. Commercial, light industrial, and residential development occurred in strips adjacent to the major roadways. The Talbot and Faulkner woolen mills in North Billerica reached peak production in the 1920s that declined during the 1960s and 1970s (MHC 1980).

Talbot Mills Dam Site History

The falls of the Concord River at the Talbot Mills Dam site have been exploited for industrial and transportation purposes since the early eighteenth century (Hazen 1883:278). A map of Billerica prepared in 1700 shows a series of falls in the Concord River between Pollard Street and Faulkner Street. Settlers attempted to induce William Sheldon to erect a corn mill on the falls by deeding him a grant of land in 1659, but a mill was never constructed. John Parker, first town clerk, later obtained this mill lot in 1663/1664, but also did not succeed in establishing a mill. In 1708, the Town of Billerica granted Christopher Osgood, an Andover miller, the land and rights to build a dam on the west side of the falls in exchange for operating a gristmill on behalf of the town residents. Osgood constructed the first dam near the current site of the Talbot Mills Dam in 1710–1711 and built a gristmill, achieving the first recorded operation at the site. The original mill dam is reported to have followed a “zig-zag” course across the river to take advantage of bedrock outcroppings for anchoring the structure. The dam is supposed to have been 5–7 feet in height and located upstream of the current structure (Hazen 1883; Ingraham 1995:1–3; Kierstead and Russo 1999; MHC 1980).
Figure 4-4. 1875 map of North Billerica showing the approximate location of the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area (source: Beers 1875).
Figure 4-5. 1889 map of North Billerica showing the approximate location of the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area (source: Walker 1889).
In 1714, William Chandler, of Andover, Massachusetts, acquired rights to a portion of the falls and began operating a fulling mill on the west bank of the river. This operation was defunct by the 1730s and Chandler had moved to Westford. In 1722, farmers owning meadows upstream of the dam tore down the structure in an effort to abate the flooding of their lands. This was the first of several controversies continuing well into the nineteenth century between farmers and various owners of the dam relating to the impoundment water levels and the flowage of meadowlands upstream of the structure. The dam was rebuilt and by the time of Osgood’s death (1739), a sawmill had been added to the privilege. His son Christopher Jr. continued to operate the mills at the privilege and added a forge on an island below the dam in 1741. In 1745, Christopher Jr. purchased land on the east bank of the river, including a share of the sawmill. The Osgoods continued as the primary owners of land and water rights at the falls through about 1749. Christopher Jr. sold a portion of the rights to Joseph Ruggles for operation of a fulling mill, and, after his death, his executor sold the remainder to Nicholas Sprake (later Sprague). Eventually, in 1759, John Carleton obtained a majority share of the privilege and the falls were commonly referred to as Careton’s Mills up through the Revolutionary War.

By 1782–1784, Thomas Richardson managed to acquire most of the water rights associated with the privilege, as well as substantial land holdings in the area, at which time the property name changed to Richardson’s Mills. Richardson sold the mills and the water rights to the Middlesex Canal Proprietors in 1794; the sale included 40 acres of land on the west bank of the river (the original Osgood grant), the mill dam, stream, and buildings. However, the proprietors were obliged to fulfill the original land grant agreement to operate the gristmill for the benefit of the public and to maintain a fishway. The Proprietors are supposed to have used the forge on the site to manufacture some components of the canal. The 1794 map of the town shows the site location marked as “Falls” and “Bridge,” but indicates none of the industrial uses of the falls at that time (see Figure 4-1). By 1799, the Proprietors had obtained the remaining share of the privilege still owned by Timothy Sprague, uniting the water rights under a single owner (Donahue 1989:52; Hazen 1883; Ingraham 1995:4–6; Kierstead and Russo 1999; MHC 1980; Whiting 1794).

The Middlesex Canal Corporation and Middlesex Canal Proprietors had been chartered through Massachusetts legislation passed in 1793 and signed by Governor John Hancock. This important transportation improvement was an effort by local businessmen and entrepreneurs to improve transportation between Boston and towns of the lower Merrimack River Valley, as well as for Boston to capture the river traffic of almost the entire Merrimack Valley and thereby improve its status as a port city. As conceived and built, the canal allowed for continuous water travel from Boston and Charlestown to the Merrimack River at Concord. The Canal was completed in 1803 and was one of the most important engineering feats and transportation improvements in the country to date. It was 27.25 miles long with twenty locks, eight aqueducts, and nearly fifty bridges and used many innovative methods in its construction, including hydraulic cement. In numerous locations there was also a clay layer called “puddling” that was installed to prevent leaks. As built, the canal prism was generally 20 feet wide at its bottom and 30.5 feet wide at the waterline and included a 10-ft-wide towpath on the east and a 5-ft-wide berm on the west. Billerica was the location of the summit of the Middlesex Canal, and as such was one of two locations (the other at Horn Pond Brook in Winchester) where water was fed to the Canal (Donahue 1989:52; Clarke 1974; Ingraham 1995:7–8; Kierstead and Russo 1999).

The canal intersected with the Concord River just a short distance upstream of Thomas Richard’s dam and mills. As the Middlesex Canal was constructed, multiple canal infrastructure components were constructed around the site for purposes of water control and to move canal barges through, into, and out of the pond behind the dam. To provide the required supplies of water to feed the canal and to establish the required elevation for canal navigation, in 1798, the Middlesex Canal Corporation constructed a new dam to replace the mill dam on the site. The canal engineer Loammi Baldwin (an important early American engineer) designed the dam as an 8-ft-high, 150 ft-long wood structure filled with gravel and
topped with 33-inch flashboards. A new gristmill and sawmill were also added (the fate of the previous mills of this type is unclear). To facilitate movement of canal boats through the dam impoundment, a towpath was constructed on an artificial peninsula on the east edge of the Mill Pond in 1802, and the remainder of the pond was spanned by a floating towpath constructed of wood. A heavy anchor stone on the west shore of the Mill Pond retained the floating towpath at that end of the impoundment (Clarke 1974; Ingraham 1995:8; Kierstead and Russo 1999; MHC 2009).

Several canal locks were built within the general vicinity of the Talbot Mills Dam that allowed boats and rafts to traverse various water levels along the canal. Like other canal locks along the Middlesex Canal, these locks were generally 80 ft long and 10–11 ft wide. Two locks were constructed adjacent to the impoundment to allow boats to enter and exit the canal while the Concord River was at water levels. On the east edge of the Mill Pond, Lincoln Lock was constructed in 1809 and rebuilt in 1818 in the vicinity of Rogers Street. Just to the south of the dam, on the west side of the Mill Pond at the current site of Talbot Mills, a canal lock of cut stone was constructed at the same time. This lock is currently under a parking deck in the mill yard of Talbot Mills. About 1,000 ft west (downstream) of the dam, the Red Lock was built near Lowell Street in 1802. This lock allowed boats to transfer between the canal and Concord River downstream of the dam (Donahue 1989:53; Kierstead and Russo 1999; MHC 2009).

Several types of ancillary structures supported canal operations or adjacent activities and were historically located near the Talbot Mills Dam. Numerous bridges were constructed over the Middlesex Canal, including several in Billerica. Two of the closest bridges to the dam were Rogers Bridge and Lund’s Bridge. Rogers Bridge was on the east side of the Mill Pond by the Toothaker Tavern. It collapsed in 1819 and was quickly rebuilt. Lund’s Bridge, otherwise known as Canal Bridge, was constructed on the west side of the Mill Pond to carry Old Elm Street/Faulkner Street. Rogers Bridge is now gone and Rogers Road runs on fill across the canal prism. Lund’s Bridge is now a concrete slab structure built (according to the date cast in its parapet) in 1930. Billerica also hosted multiple official landings for goods to be unloaded and traded along the canal. The site of one such landing was underneath the current Talbot Mills complex, just immediately to the west of the canal lock and Lund’s Bridge. Associated features of canal landings generally included a wharf and warehouses or storage sheds (Kierstead and Russo 1999; MHC 2009).

Travelling along the canal was not permitted at night; as a result, it was common to see taverns located at the canal’s lock and basin sites. The Mears Tavern may be one such tavern. The two-and-one-half-story wood-frame structure was constructed ca. 1815 on Old Elm Street immediately south of the canal landing in Billerica. The Toothaker Tavern (William Rogers’ House) was constructed about 1807 on the east side of the Mill Pond, immediately north of Lincoln Lock. This Federal Style structure still stands adjacent to the canal at the former location of Rogers Bridge (Clarke 1974; Kierstead and Russo 1999; MHC 2009).

In 1811, shortly after the construction of the Middlesex Canal, Faulkner Mills was established just north–northeast of the dam. The J. R. Faulkner & Co. Woolen Mill was “the second enterprise of this class in New England” (Hazen 1883:280) and was built on land leased from the owners of the canal. The mill was constructed by Francis Faulkner, who had moved to Billerica from Acton, Massachusetts, and was engaged in the manufacture of woolen goods, including carding, coloring, and dressing cloths. Faulkner purchased a secondary privilege (subsidiary water use rights) at the dam from the Middlesex Canal Corporation and probably installed an intake device somewhere near the eastern end of the dam, with which he was permitted to draw water “until it was three quarters of an inch below the top of the dam and flashboards” (Hazen 1883:280). According to MHC files, the current main mill building dates to 1840. The complex was later expanded with a variety of store houses and lofts (Hazen 1883:280; Ingraham 1995:11; MHC 1970).
The Middlesex Canal Corporation continued to make investments and improvements in its infrastructure throughout the first half of the nineteenth century. The 1798 dam built on the Concord River was deteriorating and considered insufficient, so the proprietors constructed the current masonry dam in 1828–1829. The new dam was approximately 150 ft long and 11 ft high, with a trapezoidal cross section constructed of cut stone masonry held together with mortar. It was built by New Hampshire contractor Daniel (“Boss”) Wilson just a few feet downstream of Baldwin’s 1798 structure. The earlier dam was preserved and the space between the two dams was filled (Figure 4-6). A fishway was set in the east end of the structure and waste gates were set on the west end of the structure, duplicating these features’ positions in the earlier dam (the fishway was filled with concrete at an unknown date after ca. 1960). The canal proprietors likely replaced the lock on the west edge of the impoundment. The 1831 map of Billerica shows the Middlesex Canal as an unlabeled watercourse entering and exiting the dam impoundment, although the dam itself is not clearly delineated. A cluster of buildings labelled “Billerica Mills” flanks both sides of the river channel (Clarke 1974; Hales 1831; Ingraham 1995:8–9; Kierstead and Russo 1999; MHC 2009) (see Figure 4-2).

For approximately 50 years, the Middlesex Canal facilitated the transportation of goods and people and remained one of the most cheap and efficient methods of transportation. However, the canal’s use slowly declined after the construction of nearby railroads caused significant declines in traffic and reduced its profitability. The construction of the Boston & Lowell Railroad in 1835, which was parallel to the canal and is northeast of the dam site, and the construction of the Lowell & Nashua Railroad in 1840 eventually led to the closure of the Middlesex Canal after its last use in 1852 (Clarke 1974; Kierstead and Russo 1999).

Brothers Charles and Thomas Talbot (the latter a future governor of the state) purchased the privilege at the Talbot Mills Dam for $20,000 in 1851. Their earliest industrial activity in Billerica was a dyewood business, which was run out of a building rented from the Middlesex Canal Corporation in the 1840s. They purchased a sawmill from Nathaniel Stearns on the northeast side of the river in 1844, which was in operation until it burned in 1853. The sawmill was noted on the 1853 Walling Map of Billerica (see Figure 4-3). After the sawmill burned, they sold the land to Francis Faulkner and bought the “prior and larger rights of the Canal Company on the other side of the stream” (Walker 1889:281). They rebuilt the dyewood mill there, which was still in operation in 1883. The 1853 Walling map shows C. P. Talbot & Co.’s operations on both sides of the river, and J. R. Faulkner’s structures to the northeast of the dam (see Figure 4-3). The sawmill is just downstream of the Faulkner Street Bridge, near the location of the present-day Talbot Mills Office. A property owned by C. P. Talbot & Co. to the southwest of the sawmill,
Cultural Context

set back from Elm Street, is most likely the dyewood mill described by Hazen in 1883. Some other holdings of C. P. Talbot & Co. are noted to the south of the dam on the west side of the Concord River. The Middlesex Canal is labeled as the “Old Canal,” though the towpath peninsula is not delineated. The canal to the west of the river is only partially shown, but the later (1889) map shows the prism in this location as open again (Ingraham 1995:13; Walker 1889).

In 1857, the Talbot brothers began construction of a brick woolen mill on the west side of the dam to the east of their dyewood mill. Two mid-nineteenth-century surveys, one from 1859 and a second undated one, show the dam and accompanying industrial infrastructure in some detail (Figures 4-7 and 4-8). The dam is shown as having a “sluiceway” at its southwest end and a fishway at its northeast end. A large “Dye House” is shown on the peninsula between the Faulkner Mill race and the river, upstream of the road (now a parking lot). The entirety of the Middlesex Canal, including its locks and the towpath peninsula are portrayed. Talbot Mill occupies an “L”-shaped footprint across the road from the dam and has a large open millrace/forebay adjacent to the street (now covered and/or filled). A second millrace begins at the northeasterly end of the dam and leads to Faulkner’s Flannel Factory, which had a square footprint. Downstream of this factory are two additional buildings, which may be the dyewood mill and sawmill. Another building, which is not identified, lies adjacent to and downstream of an island in the river channel that lies just below the bridge. In 1864, the Talbot brothers were absolved of their obligation to maintain a gristmill at the site by a town vote. C. P. Talbot & Co. expanded the mill steadily and employed 200 by the 1880s. J. R. Faulkner & Co. also grew during this period: the company’s 1811 mill was demolished and part of the new “Main Mill” structure of Faulkner Mills and Store House No. 2 were constructed in 1862. The other part of the Main Mill, and the Dye House, Picker House, Wool Shop, Engine Room, and Boiler House, were built in 1886 (1897 Hutchins Map) (Avery 1859; Folles 1970a; Folles 1970b; Hazen 1883; Kierstead and Russo 1999).

Several maps show the dam, mill, and canal infrastructure in the 1880s and 1890s. Burleigh’s 1887 “bird’s eye” view of North Billerica (Figures 4-9) and the 1889 Walker map (see Figure 4-5) clearly depict the Talbot Mills Dam, Faulkner and Talbot mills, and portions of the Middlesex Canal infrastructure. The raceways for both mills are shown, though both mills are also shown with smokestacks, indicating they were no longer powered with water alone. The former Middlesex Canal and related towpath peninsula are depicted on the east of the Mill Pond going under Rogers Bridge just south of the Toothaker (aka Rogers) Tavern. The 1889 Walker map shows that by the late nineteenth century, the current footprint of Talbot Mill and a significant portion of Faulkner Mill were largely complete (see Figure 4-5). The Mill Pond and towpath peninsula are present, though the floating towpath is again not shown, indicating it was likely no longer extant. The former Middlesex Canal is still present in this area and is traversed by a number of bridges that have been constructed over it on the property owned by Talbot Mills to connect the property on either side. There are store houses on either side of canal at the mill pond for Talbot Mills. Faulkner Mills has two small store houses on either side of Faulkner Street at the north side of the Concord River. There is also a counting room farther north on Faulkner Street, directly across from the mill and another store house to the north of the mill. Both Lund’s Bridge and the Faulkner Street Bridge are shown.

An 1897 (Hutchins) fire insurance map shows the Talbot Mills Complex in more detail. The Talbot Mills headrace (marked as a “canal,” but not the Middlesex Canal) exists from the river immediately north of the end of the dam. Flanking the “canal” in the paved parking areas immediately north and south of the headrace are a pair of buildings labelled Store House No. 2 (constructed of brick) and Shed (constructed of wood). The 1897 Hutchins map notes that Store House No. 2 was constructed in 1862; the age of the Shed is not provided. It is unknown whether the store house is the same building as the Dye House shown on the mid-nineteenth-century map of the mills (discussed above). A bridge carrying Faulkner Street over
Figure 4-7. Detail of Avery’s 1859 Survey at Billerica Mills showing the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam and appurtenances (source: Avery 1859).
Figure 4-8. Anonymous mid-nineteenth-century plan showing Concord River Diadromous Fish Restoration Project–Talbot Mills Dam and adjacent industries (Source: Middlesex Canal Commission collections).
Figure 4-9. 1887 “bird’s eye view” of North Billerica showing location of the Concord River Diadromous Fish Restoration Project—Talbot Mills Dam project area (source: Burleigh 1887).
the Concord River was still present in 1897. A Sanborn fire insurance map from 1892 (Figure 4-10) shows generally the same conditions as the 1887, 1889, and 1897 maps, with the Store House now labelled as an Office.

The 1907 Sanborn Map shows that the Talbot and Faulkner mills’ infrastructure was still consistent with the 1890s configuration by the early twentieth century. The Shed/Office adjoining the headrace at Faulkner Mills was removed. At Talbot Mills, the headrace created from the former Middlesex Canal is noted, but it is discontinuous and covered by numerous wide platforms. Portions of the second mill race are now covered with an office building that parallels Old Elm Street/Faulkner Street. A small tailrace is noted running parallel with the west elevation of the “Main Mill” structure and leading to the Concord River, and was presumably supplied from the former canal. On the banks of the Mill Pond are, from north to south, Store House No. 2, Store House No. 7, and a small Ice House. On the banks of the Concord River from west to east are a well shop; a small shop; a large ell off the rear elevation of the Main Mill consisting of Dye House 2, a Drug Room, Dye House 1, and a Dry Room; and a Finishing Room between the front of the Main Mill and the Bridge. The Talbot Mills Dam is noted on the map, and the “stone bridge” across the Concord River. At Faulkner Mills, the headrace is discernible leaving the Mill Pond just north of the Talbot Mills Dam and the tailrace enters the Concord River just south of the “Main Mill” by the dye houses along the river bank. On the south side of Old Elm Street, between the headrace and the Concord River, was a wool house (on the same location as the Dye House shown on mid-nineteenth-century maps, discussed above), which is no longer extant (Sanborn Map Company 1907).

In 1910, the Faulkner Street Bridge was reconstructed with a 106-ft curving, concrete arch bridge. The 1923 Sanborn fire insurance map (updated through 1950) shows the Faulkner Mills as the North Billerica Company, manufacturers of flannels and dress goods (Figure 4-11). Store House No. 2 at this mill complex is no longer extant, and the Old Elm Street/Faulkner Street alignment appears to cross over a portion of the building’s former location, making it evident that the roadway was realigned and widened as part of the bridge replacement. Additional buildings were constructed at the Faulkner Mills complex, but primarily to the northwest of the mill, away from the water. On the Talbot Mills complex side of the river, the entire Middlesex Canal had been covered, except for the very small portion to either side of Faulkner Street that is still visible today (Figure 4-12). The Talbot Mills Dam is not depicted on the 1923–1950 map (Roper 2000; Sanborn Map Company 1923).

In the early 1960s, Textile Subsidiary Company purchased Talbot Mills. In 1975, the Cambridge Tool and Manufacturing Company, Inc. (dba as CRT Development) purchased the entirety of the Talbot Mills property, including the dam, water rights, and property around the Mill Pond, and used the impounded water for industrial processing until town water became available. The company and the dam were subsequently acquired by Parr Industries, which in turn sold the complex, including the land around the pond but excluding the dam and water rights, to Leggett & Platt; the Cambridge Tool and Manufacturing Company, Inc./CRT Development retained the dam and water rights.

In 2011, Leggett & Platt gifted approximately 75 percent of the lands around the pond, including the towpath peninsula, to the Middlesex Canal Commission. The Faulkner Mills complex closed about 1987 and part of the complex has been used as the Middlesex Canal Museum and Visitor Center since 2005. The dam and portions of the canal and mill infrastructure remain today (see Chapter 5 Results) (Figure 4-13) (Ingraham 1995:12, 14; Raphael 2009; Raphael 2014).

**Concord River Fisheries – North Billerica Focus**

The Concord River has long been known for its sluggish waters that abound in aquatic or semi-aquatic vegetation, and its banks are fringed with wild grasses and sedges that stretch for miles along both sides
Figure 4-10. 1892 Sanborn fire insurance map showing the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area.
Figure 4-11. 1923 (updated through 1950) Sanborn fire insurance map showing Faulkner Mills (aka North Billerica Co.) and the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area (dam omitted) (source: Sanborn Map Company 1923).
Figure 4-12. 1923 (updated through 1950) Sanborn fire insurance map showing the Talbot Mills and the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area (dam omitted), with remnant sections of the Middlesex Canal on both sides of Faulkner Street (source: Sanborn Map Company 1923).
Figure 4-13. 2008 plan showing location of the Middlesex Canal National Register Historic District and extant infrastructure relating to the Middlesex Canal, including the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam (source: Middlesex Canal Commission 2008).
of the 16.3-mile-long river corridor. The Native Americans called it the *Musketaquid* or “grass-grown” river, because the grasses and placid waters create a good environment for a variety of fish, including bass, shad, alewife (river herring), pickerel, carp, and American eel species. Since the Pre-Contact and Contact periods, local Native American populations have trapped alewives and other migrating fish in the river. As early as the seventeenth century, English settlers built dams along the Concord River to increase crop production and to provide a source of power for operating gristmills and saw mills from Lowell to Concord (Hazen 1883). By the early nineteenth century, the Concord River was the site of numerous textile, paper, tanning, and mining industries with dams to provide waterpower and raceways that dumped mill waste directly in the river. In the mid-1800s, the native population of shad and alewife became extinct, in large part because the dams prevented the mature fish from returning upstream to spawn (Lowell Parks and Conservation Trust 2008). The Talbot Mills Dam in North Billerica is just one of the many blockages that caused the alewife population to collapse on the Concord River during the Post-Contact Period, although it appears that numerous attempts, albeit unsuccessful, were made by the canal and mill owners to provide some modicum means of fish passage in the eighteenth, nineteenth, and twentieth centuries.

Shortly after the first dam was erected across the Concord River in 1710–1711 in North Billerica, residents complained about it blocking fish passage. The dam was torn down in 1721 by order of the Cambridge court, but rebuilt by the mill owner one year later. Subsequent conflicts about fish passage were resolved by the dam owners opening up the spillway for two months every spring to let the fish run upstream (Donahue 1989). In 1794 a fishway was added to the dam to allow for fish passage in accordance with an agreement made in 1791 between Thomas Richardson, who purchased the dam and forty acres of land on the west bank of the river, and Timothy Spraque, a neighbor who owned a ditch that conveyed water to his fulling mill. The agreement was to maintain a grist mill for the benefit of the public and a fishway to permit fish access to the headwaters of the river (Ingraham 1995). When the Middlesex Canal Corporation built a new dam at this location in 1798, farmers upstream complained that its new height flooded their meadows upstream and ruined their hay crops. The new masonry structure also included a fishway at the end, duplicating its position in the previous mill dam and honoring earlier agreements to maintain fish passage (Ingraham 1995). In 1828 the canal company built a new dam to replace the 1798 dam and it also included a fishway at the east end (Ingraham 1995), which was required to be kept open by an act of the Legislature as early as 1821. According to Ingraham (1995), the fishway obligation may have been repealed by 1835, but it still appears on the 1859 plan of Billerica Mills (see Figure 4-6).

The mill owners who bought the dam and mill privilege from the Middlesex Canal Corporation in 1851 do not appear to have paid much attention to the function of the fish ladder, since the demand for mill wastewater kept the fishway closed most of the time, regardless of the legal mandates (Ingraham 1995). In 1994, Ingraham reported that the dam had a “wooden fish ladder at the east end [of the dam],” but it was filled with concrete sometime after the 1960s, rendering it useless and obscuring its original appearance. There are no fish ladder remains visible today at the dam, although such evidence may be hidden below the spring pond level. Belding’s 1920 *The Commonwealth of Massachusetts: A Report Upon the Alewife Fisheries of Massachusetts* does not identify the Concord River as having any alewife fishery since at least 1870, which corresponds to the unsuccessful attempts to maintain an open, functioning fishway passage through the dam by the canal proprietors and early and later mill owners.

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2 Chapter 89 of the Acts and Resolves of the General Court of the Commonwealth passed in 1835 repealed all laws obliging the proprietors of mills on the Concord River to leave a passage in their dams for fish. Local laws may have still required provision of fish passage, however (MGC 1835).
CHAPTER FIVE

RESULTS

Historic Resources

The Talbot Mills Dam recommended preliminary APE contains two historic properties listed in the National Register: The Billerica Mills Historic District (aka North Billerica Mills District, MHC Nos. BIL.O, BIL.E) in Billerica and the (Billerica segment of the) Middlesex Canal Historic and Archaeological District (MHC Nos. BIL.T, BIL.K, BIL.P). The Talbot Mills Dam (MHC No. BIL.900) is within the boundaries of both historic properties, and the dam structure and its impoundment are adjacent to or within the viewshed of resources that contribute to the significance of one or both of the historic properties. There are no previously un-surveyed resources over 50 years of age within the recommended preliminary Project APE. Historic properties and their contributing resources are listed in Table 5-1 and mapped in Figure 5-1 (using assigned PAL Map identifications).

Although the boundaries of the two historic districts extend far beyond the Project locus, reconnaissance survey results are presented for the historic properties’ boundaries and contributing resources that abut or are within the viewshed of the dam and impoundment (as defined in Geotechnical Consultants, Inc. 2015: Figure 3), those that might be anticipated to be subject to direct or indirect impacts from the Project alternatives under consideration. Information about other contributing resources within the two historic districts and the full extent of the National Register boundaries is in Appendix A.

Talbot Mills Dam

The Talbot Mills Dam (MHC No. BIL.900/BIL-HA-8/BIL-HA-9, PAL Map ID 7) is a run-of-the-river (aka weir), gravity-type, masonry arch structure located approximately 4.2 miles south (upstream) of the confluence of the Concord and Merrimack rivers (Figures 5-2, 5-3, 5-4, and 5-5). The Concord River, with a general northerly flow at this point, makes a sharp bend to the west as it passes over the falls, and the dam is on a northeast (river right) to southwest (river left) alignment across the river channel. The dam impoundment covers approximately 8.6 acres south of the dam. The stone masonry dam is approximately 165 ft long and consists of a spillway flanked by two abutments that tie into retaining/training walls for the river and impoundment. Fill is reportedly packed against the sloping upstream side of the dam, between it and an older 1798 structure (see Figure 4-6). The approximately 127-ft-long spillway is constructed of mortared granite ashlar, has a trapezoidal cross-section 8 ft wide at the base and 7 ft wide at the crest, and a curving footprint. A narrow capstone runs across the crest near its downstream lip, and there are no flashboards on the structure. The northeasterly abutment is approximately 20 ft long and constructed of granite ashlar laid in alternating header and stretcher courses. Portions of the top course of the abutment are braced with an iron strap. A large gap in the abutment

1 According to the 2009 and 2015 dam inspection reports (Geotechnical Consultants, Inc. 2009 and 2015), the overall length of the dam is approximately 316 ft, which includes areas of impoundment shoreline flanking the river channel that contain the mill raceways for the Talbot and Faulkner mills. It is unknown whether these portions of shoreline were constructed to serve as part of the dam or are pre-existing natural landforms later bisected by the raceways and armored with retaining walls to prevent scouring. For purposes of this report, the areas of impoundment shoreline flanking the dam are treated as the latter, and the raceways are accounted for in these results within the discussions of their respective mill complexes.
Table 5-1. Historic Resources within the Recommended Preliminary APE for the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area.

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between the spillway and the river retaining/training wall is filled with a poured concrete wall—this is reportedly the former location of a wood fish ladder that was filled with cement sometime after 1960. The abutment is capped with a single massive granite block. The southwesterly abutment is approximately 17 ft long and constructed of masonry similar to that of the other abutment, including a large capstone. At the base of the abutment are two poured concrete low-level outlets that are currently blocked. Numerous anchor holes are drilled into the top of the abutment—these are likely related to a pair of waste gates that, after several replacements, were removed about 1950. The 2015 inspection of the dam found the structure to be in fair overall condition; with no significant changes found since the previous inspection/evaluation report dated May 22, 2009 (Geotechnical Consultants, Inc. 2009 and 2015).

The Talbot Mills Dam was constructed in 1828–1829 at the site of a previous water privilege that was first dammed by Christopher Osgood for a gristmill in 1710–1711, as detailed in Chapter 4. At the turn of the nineteenth century, the Middlesex Canal Corporation built a new dam at the site that consisted of a wood weir filled with gravel to divert water from the Concord River into the canal. Water retained by the dam also supported ongoing industrial activities undertaken by both the Canal Company and lessees. That dam was considered insufficient and the canal proprietors ordered the construction of the current masonry dam in 1828. As railroad competition caused the Middlesex Canal to fail, Charles and Thomas Talbot purchased the privilege in 1851 and established the core portion of the current mills.

Faulkner Woolen Mills, founded in 1811, and Talbot Woolen Mills, founded in 1857, both made use of the dam and their success led to the growth of the North Billerica mill village. Because the Talbot Mills Dam was a critical water control structure that supported the operation of the Middlesex Canal, it is identified as a contributing resource to the Middlesex Canal Historic and Archaeological District (MHC Nos. BIL.T, BIL.K, BIL.P), which is described below. Although the dam supported the operations of multiple historic-period industrial operations at the falls, including the extant Faulkner and Talbot mills, it is mapped within, but not specifically identified as a contributing resource to, the Billerica Mills Historic District (MHC Nos. BIL.O, BIL.E), which was listed in the National Register in 1983. Given the dam’s direct relationship to the mills’ historical operations, it should be considered a contributing resource to this historic district (see Billerica Mills Historic District section below). The structure retains integrity, although the removal of the historic-period fishway and spillway gates are alterations from its period appearance and function (Fitch et al. 1983; Hale 1972; MHC and Middlesex Canal Association 2009).

Middlesex Canal Historic and Archaeological District

The Talbot Mills Dam contributes to the significance of the Middlesex Canal Historic and Archaeological District (MHC Nos. BIL.K, BIL.T, and BIL.P, PAL Map ID 2), which was listed in the National Register in 1972 and expanded in 2009. It extends as an irregular, approximately 75-ft-wide linear corridor for approximately 6 miles in northern Billerica, and then continues into adjoining communities along the historic canal route for its full 27.25-mile extent between Charlestown and Lowell. The district contains 225 individual contributing resources (220 sites and 5 buildings) that relate to the canal’s historical function, including intact sections of earth canal prism and remains of 5 aqueducts. Only one lock survives: the lock in the Talbot Mills property in the recommended Project APE (Hale 1972; MHC and Middlesex Canal Association 2009).

The Middlesex Canal was a business venture funded by regional entrepreneurs to resolve the trade barriers that costly and difficult overland transportation at the time imposed between the port city of Boston and inland regions of Vermont and New Hampshire. Boston lacked any substantial river connection to these inland regions, which primarily relied on the Merrimack and Connecticut rivers for their water transportation. The intent of the canal was to capture the trade of the Merrimack River and bring it to Boston. The canal corporation was incorporated by 13 men from the Boston region led by Massachusetts Attorney General James Sullivan and important American engineer Loammi Baldwin. The
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Figure 5-1. Map of historic and archaeological (canal-related) resources within the recommended preliminary APE for the Concord River Diadromous Fish Restoration Project–Talbot Mills Dam project area
Figure 5-2. General view of Talbot Mills Dam (aka Middlesex Canal Dam and Locks, MHC No. BIL.900) looking northeast. This resource contributes to the significance of the Middlesex Canal Historic and Archaeological District, a historic property listed in the National Register. Faulkner Mills (MHC No. BIL.77), at left, contributes to the significance of the Billerica Mills Historic District, also a historic property.

Figure 5-3. General view of Talbot Mills Dam (aka Middlesex Canal Dam and Locks, MHC No. BIL.900) looking southwest. Talbot Mills (MHC No. BIL.80), at rear, and the Faulkner Street Bridge (MHC No. BIL.935), at right, contribute to the significance of the Billerica Mills Historic District, a historic property listed in the National Register.
Figure 5-4. Detail of the Talbot Mills Dam southwest (river left) abutment with concrete low-flow outlet and former location of waste gates (now removed).

Figure 5-5. Detail of the Talbot Mills Dam northeast (river right) abutment and former location of wood fishway.
canal was constructed between 1793 and 1803 and operated until the canal corporation failed in the 1850s. The Middlesex Canal is significant at the national, state, and local levels in the areas of Engineering, Transportation, Commerce, and Social History as an “outstanding engineering accomplishment and major transportation improvement of the early 19th century,” and was one of the largest construction projects in the country at that time. The district’s period of significance is defined as 1803–1852 (Hale 1972; MHC and Middlesex Canal Association 2009).

Billerica Mills Historic District

The Talbot Mills Dam is located within the northern portion of the Billerica Mills Historic District (MHC No. BIL.O, PAL Map ID 1) in Billerica, listed in the National Register in 1983, and the overlapping Billerica Mills Historic District (MHC No. BIL.E), a local historic district (LHD). This extensive mill village is significant at the local level in the areas of Industry, Transportation, Commerce, Engineering, Architecture, Community Planning, and Archaeology. The Talbot and Faulkner mills, which anchor the village on the north edge of the district, were notable for wool textile production and the surrounding mill village is largely associated with these two factories. The area has a period of development of 1650 to 1880 and contains 116 inventoried resources constructed from 1803 to 1982. The period of significance, which is not specified in the National Register nomination form, is broadly defined as ca. 1800–ca. 1950.

The district is dominated by the mills at the north end and rows of worker housing lining streets south of the two mills. The dwellings primarily consist of double houses and row houses to the west of the Mill Pond with a few to the east and some single-family houses and institutional buildings (such as a school
Figure 5-6. Canal Segment 24 and a warehouse (MHC No. BIL.317) of the Talbot Mills on the west side of the dam impoundment. Canal Segment 24, filled by waters of the dam impoundment, is part of the Middlesex Canal Historic and Archaeological District, a historic property listed in the National Register.

Figure 5-7. Canal Segment 24, looking west toward the Talbot Mills Dam impoundment and the Faulkner and Talbot mills.
Figure 5-8. The Middlesex Canal Lock (part of the Middlesex Canal Dam and Lock complex, MHC No. BIL.900) at the west end of Canal Segment 24, a contributing resource to the Middlesex Canal Historic and Archaeological District.

Figure 5-9. The Middlesex Canal Floating Towpath Peninsula (MHC No. BIL.953) in the Talbot Mills Dam impoundment, looking north from Old Elm Street/Faulkner Street. This resource contributes to the significance of the Middlesex Canal Historic and Archaeological District.
and two churches) toward the western end of the district. These buildings represent a diverse range of architectural styles: Georgian, Federal, Greek Revival, Gothic Revival, Italianate, Queen Anne, Victorian Eclectic, Craftsman, and Colonial Revival, with some post-war dwellings interspersed as infill (Fitch et al. 1983).

The brick and concrete mill and loft complexes of the J. R. Faulkner Mills (MHC No. BIL.77, 1840 et seq., PAL Map ID 4) and the Talbot Mills (MHC No. BIL.80, established 1857, PAL Map ID 3) are contributing resources to the Billerica Mills Historic District and were powered by the Talbot Mills Dam; however, the dam is mapped but not specifically listed as a contributing resource to the historic district. Faulkner Mills is a Victorian Eclectic brick textile mill complex about 100 ft north of the dam, across Old Elm Street/Faulkner Street (see Figure 5-2). The mill was formerly waterpowered and has an extant mill raceway that begins approximately 25 ft east of the dam’s northeast abutment and is visible as an open, watered concrete-lined channel about 15 ft wide containing a water control gate (Figure 5-10).

Talbot Mills is a sprawling Victorian Eclectic brick textile mill constructed on the west side of the Concord River, about 30 ft west of the impoundment shoreline (see Figure 5-3). To the west of the original portion of the mill is a later dye house, with a later powerhouse connecting the two structures. Nearby are smaller associated buildings, including an office and storage buildings. One of the storage buildings, a warehouse at 2 Old Elm Street (MHC No. BIL.317, PAL Map ID 6), is immediately adjacent to the shore of the impoundment (see Figure 5-6). Talbot Mills was also formerly waterpowered. Its underground mill raceway is reported to be filled (see Chapter 4), but the raceway intake remains on the edge of the impoundment about 50 ft south of the southwest dam abutment as a row of 5 vertical lift gates with rack-and-pinion gear lift mechanisms partially intact (Figure 5-11) (Geotechnical Consultants, Inc. 2015:4). Because the dam provided water to power the Faulkner and Talbot mills, it is directly associated with the historical development of the Billerica Mills Historic District and therefore potentially contributes to the significance of this historic property.

Other contributing resources to the Billerica Mills Historic District that are immediately adjacent to or within the viewshed of the Mill Pond are the Faulkner Street Bridge over the Concord River (MHC No. BIL.935, built 1910, PAL Map ID 5); the Faulkner Kindergarten (MHC No. BIL.78, built 1826, PAL Map ID 8); the William Rogers House (aka Toothaker Tavern, ca. 1807, MHC No. BIL.128, PAL Map ID 10); the Talbot Woolen Mills Worker Housing (two buildings, MHC Nos. BIL.273 and BIL.274, ca. 1865, PAL Map IDs 11 and 12), and a warehouse (MHC No. BIL.317, ca. 1890, PAL Map ID 6) (See Figure 5-3, Figures 5-12, 5-13, and 5-14).

Archaeological Resources

Site File Review

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Figure 5-10. Raceway of the Faulkner Mills, looking west from the vicinity of the Talbot Mills Dam.

Figure 5-11. Raceway intake gates of the Talbot Mills, looking southwest.
Figure 5-12. Faulkner Kindergarten (yellow building, MHC No. BIL.78), a contributing resource to the Billerica Mills Historic District, a historic property listed in the National Register.

Figure 5-13. The William Rogers House (aka Toothaker Tavern, MHC No. BIL.128), a contributing resource to the Billerica Mills Historic District, a historic property listed in the National Register.
Figure 5-14. Talbot Woolen Mills Worker Housing (MHC Nos. BIL 273 and 274), contributing resources to the Billerica Mills Historic District, a historic property listed in the National Register.
Table 5-2. Recorded Pre- and Post-Contact Sites within One Mile of Talbot Mills Dam.

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Sensitivity Assessment – Conceptual Design Alternatives

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Figure 5-15a. Archaeological sensitivity map for Alternative 1, conceptual fishway plan, Concord River Diadromous Fish Restoration–Talbot Mills Dam project area (potential direct impacts) CONFIDENTIAL–NOT FOR PUBLIC DISTRIBUTION (SECTION 304 OF THE NHPA AS AMENDED, 16 U.S.C. 470W-3(a) TO (c)) and MGL C.9, S.26A(1) and 27C UNDER 950 CMR 70.13(7)
Figure 5-15b. Archaeological sensitivity map for Alternative 2, conceptual dam removal plan, Concord River Diadromous Fish Restoration–Talbot Mills Dam project area (potential direct impacts)
CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

Historic Properties

The Talbot Mills Dam (MHC No. BIL.900) is a historic property listed in the National Register as a contributing resource to the Middlesex Canal Historic and Archaeological District (MHC Nos. BIL.T, BIL.K, BIL.P) and is a potential contributing resource to the Billerica Mills Historic District (MHC Nos. BIL.O, BIL.E). The dam was essential to the function of the Middlesex Canal and to the Faulkner and Talbot mills within the Billerica Mills Historic District, providing water for canal navigation and textile manufacturing during the historic period.

The Project proponents are currently exploring two conceptual alternatives at Talbot Mills Dam to restore diadromous fish to the upper Concord River system: 1) construction of a concrete Denil fish ladder attached to the river right (northeasterly) concrete abutment of the dam (with or without an eel ramp add-on and/or notch in the spillway for downstream fish passage); or, 2) dam removal. Either alternative would cause direct impacts on historic properties (as defined under 36 CFR 800.5).

Denil Fish Ladder Alternative

The Talbot Mills Dam included a fish ladder during the historic period of operation. If reinstitution of a fish ladder structure is selected as the preferred alternative, PAL recommends that the design of the new structure should conform to the Secretary of the Interior’s Standards for the Treatment of Historic Properties (SOI Standards, 36 CFR Part 68) to minimize potential adverse effects to the Middlesex Canal Historic and Archaeological District and to the North Billerica Mills Historic District. Further research would be recommended into the location and appearance of the historic-period fish ladder so that any new design is sympathetic to the surrounding historic context of the districts, requires minimal alterations to the dam, and is thus compliant with the SOI Standards. Implementation of the eel ramp add-on should also conform to the SOI Standards such that it does not change the character of the property. The cutting of a notch in the dam spillway would represent the destruction or alteration of part of the historic dam and would result in an adverse effect. It would also constitute an adverse effect on the Middlesex Canal Historic and Archaeological District if the lowering of the water level in the impoundment changes the functional relationship of the impoundment, lock, Canal Segment 24, Floating Towpath Peninsula, and the Floating Towpath Anchor Stone.

Dam Removal Alternative

The removal of the Talbot Mills Dam would constitute an adverse effect on the Middlesex Canal Historic and Archaeological District and the Billerica Mills Historic District by destroying an important contributing resource within those districts—the dam itself. The removal of the dam would also dewater Canal Segment 24, and thus alter the functional relationship of the impoundment, lock, Canal

---

1 With regard to the overlapping Billerica Mills Local Historic District (LHD), any new construction or alterations to the exterior of buildings and structures within the LHD will not receive a building permit until the proposed work has been issued a certificate of appropriateness from the Billerica Historic Districts Commission (BHDC 1990, 2015). PAL recommends that the proponent consult with the BHDC about review of the proposed work within the LHD.

Archaeological Resources

Text Removed - CONFIDENTIAL– NOT FOR PUBLIC DISTRIBUTION (SECTION 304 OF THE NHPA AS AMENDED, 16 U.S.C. 470W-3(a) TO (c)) and MGL C.9, S.26A(1) and 27C UNDER 950 CMR 70.13(7)
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APPENDIX A

EXTRACTS FROM NATIONAL REGISTER OF HISTORIC PLACES REGISTRATION FORMS AND SELECT INVENTORY OF THE HISTORIC ASSETS OF THE COMMONWEALTH FORMS FOR THE TALBOT MILLS DAM RECOMMENDED PROJECT APE
United States Department of the Interior
National Park Service

National Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in How to Complete the National Register of Historic Places Registration Form (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name________ Middlesex Canal Historic and Archaeological District

other names/site number__________

2. Location

street & number _______ between Merrimack River, Lowell, running southeast to Charles River, Boston X not for publication through Lowell, Chelmsford, Billerica, Wilmington, Woburn, Winchester, Medford, Somerville city or town_________ and Boston (Charlestown) ________________________ ________ vicinity

state__ Massachusetts code__ MA __ county__ Middlesex, Suffolk code__ 017, 025 __ zip code__________

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1986, as amended, I hereby certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property meets does not meet the National Register Criteria. I recommend that this property be considered significant nationally statewide locally. (See continuation sheet for additional comments.)

Signature of certifying official/Title Brona Simon, SHPO, Executive Director Date 9/18/09

Massachusetts Historical Commission State or Federal agency and bureau

In my opinion, the property meets does not meet the National Register criteria. (See continuation sheet for additional Comments.)

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is: entered in the National Register

See continuation sheet.

determined eligible for the National Register

See continuation sheet.

determined not eligible for the National Register

See continuation sheet.

removed from the National Register

other (explain):__________

Signature of the Keeper Date of Action
5. Classification

<table>
<thead>
<tr>
<th>Ownership of Property</th>
<th>Number of Resources within Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Check as many boxes as apply)</td>
<td>(Do not include previously listed resources in the count.)</td>
</tr>
<tr>
<td>x private</td>
<td>5 contributing building(s)</td>
</tr>
<tr>
<td>x public-local</td>
<td>795 noncontributing building(s)</td>
</tr>
<tr>
<td>x public-State</td>
<td>220 contributing site(s)</td>
</tr>
<tr>
<td>x public-Federal</td>
<td>2 noncontributing site(s)</td>
</tr>
<tr>
<td></td>
<td>5 contributing structure(s)</td>
</tr>
<tr>
<td></td>
<td>802 noncontributing structure(s)</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>

Name of related multiple property listing
(Enter “N/A” if property is not part of a multiple property listing.)

0

Number of contributing resources previously listed in the National Register

38 (see continuation sheet)

6. Function or Use

<table>
<thead>
<tr>
<th>Historic Functions</th>
<th>Current Functions</th>
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<tbody>
<tr>
<td>TRANSPORTATION/water-related canal</td>
<td>TRANSPORTATION/road-related parkway, paths</td>
</tr>
<tr>
<td>COMMERCE/TRADE/site with evidence of trade</td>
<td>COMMERCE/TRADE/retail businesses</td>
</tr>
<tr>
<td>DOMESTIC/single dwelling</td>
<td>DOMESTIC/single family, apartments, condominiums</td>
</tr>
<tr>
<td>AGRICULTURE/SUBSISTENCE/irrigation facility-canal</td>
<td>FUNERARY/cemetery</td>
</tr>
<tr>
<td></td>
<td>RECREATION AND CULTURE/outdoor recreation -</td>
</tr>
<tr>
<td></td>
<td>Park, hiking trail, commemorative marker</td>
</tr>
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7. Description

<table>
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<tr>
<th>Architectural Classification</th>
<th>Materials</th>
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<td>(Enter categories from instructions)</td>
<td>(see text)</td>
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<tr>
<td></td>
<td>(Enter categories from instructions)</td>
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<tr>
<td></td>
<td>foundation</td>
</tr>
<tr>
<td></td>
<td>walls</td>
</tr>
<tr>
<td></td>
<td>roof</td>
</tr>
<tr>
<td></td>
<td>other</td>
</tr>
</tbody>
</table>

Narrative Description
(Describe the historic and current condition of the property on one or more continuation sheets.)
8. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B Property is associated with the lives of persons significant in our past.
- C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:
- A owned by religious institution or used for religious purposes.
- B removed from its original location.
- C a birthplace or grave.
- D a cemetery.
- E a reconstructed building, object, or structure.
- F a commemorative property.
- G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance
(Enter categories from instructions)

- COMMERCE
- ENGINEERING
- SOCIAL HISTORY
- TRANSPORTATION

Period of Significance
1803-1852

Significant Dates
1803 – opened and operated
1852 – last trip

Significant Person
(Complete if Criterion B is marked above)

Cultural Affiliation

Architect/Builder
Loammi Baldwin, Civil Engineer

Narrative Statement of Significance
(Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References
(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):
- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey
- recorded by Historic American Engineering Record

Primary location of additional data:
- State Historic Preservation Office
- Other State agency
- Federal agency
- Local government
- University
- Other

Name of repository:
Middlesex Canal Museum, Billerica, MA
10. Geographical Data

Acreage of Property  **approximately 253 acres**

**UTM References**  
See continuation sheet.  
(Place additional UTM references on a continuation sheet)

1.  19 307120 4723100  
   Zone  Easting  Northing  
   19 308200 4721100  
   Zone  Easting  Northing

2.  19 307560 4722000  
   Zone  Easting  Northing  
   19 308980 4720400  
   Zone  Easting  Northing

---  
**Verbal Boundary Description**  
(Describe the boundaries of the property on a continuation sheet.)

**Boundary Justification**  
(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title  **Staff of the Massachusetts Historical Commission, with Susan Keats, Nolan Jones, Middlesex Canal Assn.**

organization  **Massachusetts Historical Commission**  
date  August 2009

street & number  **220 Morrissey Boulevard**  
telephone  **617-727-8470**

city or town  **Boston**  
state  **MA**  
zip code  **02125**

Additional Documentation

Submit the following items with the completed form:

**Continuation Sheets**

**Maps**
- A USGS map (7.5 or 15 minute series) indicating the property's location.
- A sketch map for historic districts and properties having large acreage or numerous resources.

**Photographs**
- Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

**Property Owner**
(Complete this item at the request of the SHPO or FPO.)

name  **multiple**

street & number  

telephone  

city or town  
state  
zip code  

**Paperwork Reduction Act Statement:** This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.).

**Estimated Burden Statement:** Public reporting burden for this form is estimated to average 18.1 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Project (1024-0018), Washington, DC 20503.
GEOGRAPHIC DATA (continued)

Verbal Boundary Description

The Middlesex Canal Historic and Archaeological District is a 75-foot-wide corridor running southeastward 27.25 miles from the Merrimack River in Lowell, to the Charles River in Boston (Charlestown), MA. This width includes the canal bed itself, which averaged 30.5 feet across, adjacent canal paths, locks, bridges, aqueducts, and other structures associated with the canal’s operation and maintenance.

For the purposes of the present nomination, the location of the canal has been divided into 82 segments that collectively span the route used by the canal. The 75-foot-wide corridor contains a variety of conditions that are both visible and not visible, watered and dry, paved over and exposed, greatly altered and relatively unchanged. The accompanying map book provides a detailed analysis of the canal’s path, superimposed upon current streets and parcel lines, while the enclosed USGS maps provide an overall projection of the route.

Verbal Boundary Justification

The district includes the route of the Middlesex Canal, a privately funded enterprise that, during the first half of the 19th century, moved passengers and freight from interior New England to Boston and connections to American and foreign ports. Using a combination of historic maps and descriptions, considerable research undertaken by the Middlesex Canal Association, contemporary archaeological surveys, and modern technology, a detailed mapping of the canal bed from Lowell to Boston can now be considered accurate. The district includes both the canal bed itself as well as adjacent elements directly connected with its administration and functioning.

A 1972 National Register nomination for the Canal only covered the northern portion between Lowell and Woburn, and counted the canal as a single resource. Several canal-associated resources that stand immediately adjacent to the Canal’s path were individually listed in the National Register in past efforts.

The present 2009 nomination extends the entire length of the Canal, and the datasheets provide a detailed examination and enumeration of all elements, current boundaries, and segments, many of which have been paved over or buried during the two centuries since its construction. Canal-associated resources within the defined boundary corridor are considered contributing; other resources (such as taverns or houses associated with canal operators) outside the defined boundary are mentioned in the text but are not included in the nomination. Standing structures within the defined boundary corridor that postdate the period of significance are considered noncontributing.
<table>
<thead>
<tr>
<th>Bi-33 CANAL Segment 15</th>
<th>Town line to 300 ft. S. of Brick Kiln Rd. ca.1802 Canal prism Si/C visible, dry</th>
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<tr>
<td>MCD # 8---8</td>
<td>vacant land 0 Brick Kiln Road</td>
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<td>MAP # 1</td>
<td>10 8---9 (building outside district boundary) 62 Alpine St</td>
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<tr>
<td>MHC # 1</td>
<td>ca.1958 ranch, 1-family</td>
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<tr>
<td>ASSRs # 1</td>
<td>9A 8---10---2 (building outside district boundary) 54 Alpine St</td>
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<tr>
<td>NAME</td>
<td>ca.1922 four square, 1-family</td>
</tr>
<tr>
<td>LOCATION</td>
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<table>
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<th>300 ft. S. of  Brick Kiln Rd. to  800 ft. N. of Boston Rd ca. 1802 Canal prism Si/C visible, wetted</th>
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<td>(building outside district boundary) 56 Alpine St ca.1994 1-1/2-story, 1-family</td>
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<tr>
<td>MAP # 1</td>
<td>9C 8---10---1 (building outside district boundary) 50 Alpine St ca.1995 2-story, 1-family</td>
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<tr>
<td>MHC # 1</td>
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<tr>
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<tr>
<td>NAME</td>
<td>6 8---13 (building outside district boundary) 38 Alpine St ca. 1930 2-story, 2-family</td>
</tr>
<tr>
<td>LOCATION</td>
<td>5 8---69 (building outside district boundary) 36 Alpine St ca. 1978 Colonial Revival, 1-family</td>
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<tr>
<td>DATE</td>
<td>4 8---70 (building outside district boundary) 34 Alpine St ca. 1950 Colonial Revival, 1-family</td>
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<tr>
<td>DESCRIPTION</td>
<td>3 8---56 (building outside district boundary) 32 Alpine St ca. 1965 Cape, 1-family</td>
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<td>TYPE/STATUS</td>
<td>11 8---57 (building outside district boundary) 30 Alpine St ca. 1940 garage</td>
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<tr>
<th>Bi-35 CANAL Segment 17</th>
<th>800 ft. N. of Boston Rd to 300 ft. N. of Boston Rd. ca. 1802 Canal prism Si/C mostly visible, dry</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD # 29 8---21</td>
<td>(building outside district boundary) 13 McLennan Way ca.1988 2-story, 1-family</td>
</tr>
<tr>
<td>MAP # 1</td>
<td>17 8---22 vacant land McLennan Way</td>
</tr>
<tr>
<td>MHC # 1</td>
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</tr>
<tr>
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<table>
<thead>
<tr>
<th>Bi-36 CANAL Segment 18</th>
<th>to Boston Rd vicinity ca. 1802 Canal prism Si/C not visible, open ground</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCD # 34 9---200</td>
<td>stores 95 Boston Post Road ca. 1960 1-story, strip mall B/NC</td>
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<tr>
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<tr>
<td>ASSRs # 1</td>
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<tr>
<th>Bi-37 Sprague Bridge</th>
<th>Boston Rd./Route 3A ca. 1802 Bridge site Si/C not visible</th>
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<tbody>
<tr>
<td>MCD # 30 9---215</td>
<td>(building outside district boundary) 13 McLennan Way ca.1988 2-story, 1-family</td>
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<tr>
<td>MAP # 1</td>
<td>36 9---216 vacant land Lowell St</td>
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<table>
<thead>
<tr>
<th>Bi-38 CANAL Segment 19</th>
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<tbody>
<tr>
<td>MCD # 19 9---6</td>
<td>commercial 98 Boston Rd ca. 1945 1-story B/NC</td>
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<thead>
<tr>
<th>Bi-39 HA-42 Culvert ruins Lowell St</th>
<th>Lowell St ca. 1802 Culvert site Si/C visible</th>
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<tbody>
<tr>
<td>MCD # 1 9---9</td>
<td>Town of Billeria Fire Station 21 Lowell St ca. 1950 1-story B/NC</td>
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<tr>
<td>MAP # 2 9---256</td>
<td>(building outside district boundary) 30 Lowell St</td>
</tr>
<tr>
<td>MHC # 1 9---22</td>
<td>(building outside district boundary) 30 Lowell St</td>
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<td>ASSRs # 1</td>
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<thead>
<tr>
<th>Bi-40 CANAL Segment 20</th>
<th>Holt St. to fire station ca.1802 Canal prism Si/C not visible, built over</th>
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<tr>
<td>MCD # 1 9---215</td>
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<tr>
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<tr>
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</tr>
<tr>
<td>MAP # 2 9---256</td>
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<tr>
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<tr>
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<td>MHC # 1</td>
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<th>Bi-44 CANAL Segment 22</th>
<th>fire station to N end Talbot Mill parking lot ca. 1802 Canal prism Si/C visible, dry</th>
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</thead>
<tbody>
<tr>
<td>MCD # 1 9---215</td>
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</tr>
<tr>
<td>MAP # 1</td>
<td>36 9---216 vacant land Lowell St 211 9---211 vacant land Lowell St</td>
</tr>
<tr>
<td>MHC # 1</td>
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<td>Bi-48</td>
<td>CANAL Segment 23</td>
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<td>Bi-51</td>
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<td>Bi-52</td>
<td>Lund Bridge</td>
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<td>Bi-53</td>
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<tr>
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<td>Bi-56</td>
<td>Rogers Bridge</td>
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<td>Bi-57</td>
<td>Lincoln Lock</td>
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<td>Bi-58</td>
<td>Tufts Bridge</td>
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<td>CANAL Segment 25</td>
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<td>CANAL Segment 26</td>
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<tr>
<td>Bi-61</td>
<td>Davis Bridge</td>
</tr>
<tr>
<td>Bi-62</td>
<td>Culvert between Pond &amp; Gray sts. (Bill. Map 5)</td>
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</tbody>
</table>

All parcels through which the canal passes are on the datasheet. When a building on the parcel lies outside the district boundary it is not counted as a resource even when it falls into the period of significance for the district (1803-1852).
United States Department of the Interior  
National Park Service  

National Register of Historic Places  
Inventory—Nomination Form  

See instructions in How to Complete National Register Forms  
Type all entries—complete applicable sections  

1. Name  

historic  Billerica Mills Historic District (preferred)  
and/or common  North Billerica  

2. Location  

street & number  Multiple—see continuation sheet  
N/A not for publication  
city, town  Billerica  
N/A vicinity of  
state  Massachusetts code 025  
county Middlesex code 017  

3. Classification  

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<th>Present Use</th>
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<td>public</td>
<td>occupied</td>
<td>agriculture</td>
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<tr>
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<td>private</td>
<td>unoccupied</td>
<td>X commercial</td>
</tr>
<tr>
<td>structure</td>
<td>both</td>
<td>work in progress</td>
<td>X educational</td>
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<tr>
<td>site</td>
<td>Public Acquisition</td>
<td>X yes; restricted</td>
<td>entertainment</td>
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<tr>
<td>object</td>
<td>N/A in process</td>
<td>yes; unrestricted</td>
<td>government</td>
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<tr>
<td></td>
<td>N/A being considered</td>
<td>no</td>
<td>industrial</td>
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<td></td>
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<td>X military</td>
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4. Owner of Property  

name  Multiple—see continuation sheet  
street & number  
city, town  
N/A vicinity of  
state  

5. Location of Legal Description  
courthouse, registry of deeds, etc.  Middlesex County Registry of Deeds  
street & number  Gorham Street  
city, town  Lowell  
state Massachusetts  

6. Representation in Existing Surveys  
Inventory of the Historic Assets of the Commonwealth  
has this property been determined eligible?  yes X no  
date 1973  
X federal  state  county  local  
depository for survey records  Massachusetts Historical Commission, 294 Washington Street  
city, town  Boston  
state Massachusetts
10. Geographical Data

Acreage of nominated property: approximately 75
Quadrangle name: Billerica, Mass.

UTM References

<table>
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<th>Easting</th>
<th>Northing</th>
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<td>312560</td>
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<tr>
<td>B</td>
<td>19</td>
<td>312960</td>
</tr>
<tr>
<td>C</td>
<td>19</td>
<td>312630</td>
</tr>
<tr>
<td>E</td>
<td>19</td>
<td>312200</td>
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<th>Northing</th>
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<td>D</td>
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Verbal boundary description and justification
See continuation sheet.

List all states and counties for properties overlapping state or county boundaries

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<th>state</th>
<th>code</th>
<th>county</th>
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11. Form Prepared By

Virginia A. Fitch, Preservation Planner (MHC) with Mary E. Myer, Northern Middlesex Area Commission and Dr. Charles E. Stearns, Billerica Historical Commission

Massachusetts Historical Commission

294 Washington Street

Boston, Massachusetts 02108

Telephone: (617) 727-8470

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

- national
- state [X]
- local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-655), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

State Historic Preservation Officer signature: [Signature]

Date: [Date]

For NPS use only

I hereby certify that this property is included in the National Register.

Date: [Date]

Keeper of the National Register

Chief of Registration
National Register of Historic Places Inventory—Nomination Form

Billerica-Mills Historic District, Billerica, Massachusetts: Item number 10

GEOGRAPHICAL DATA: VERBAL BOUNDARY DESCRIPTION

The proposed Billerica Mills Historic District includes land associated with the industrial use of the site from the first documented grist mill (1708) to the 19th century mill community. It includes approximately seventy-five acres. An 18th century road now known as Rogers' Street, Faulkner Street, Elm Street, and Colson Street generally define the district. The Rogers' Street section—about 1,500 feet—runs from the Canal Bridge north along the Mill Pond, bends west over the mill bridge, continues west for about 1,500 feet and returns south to the Fordway Bridge. Teh Fordway was a potentially significant Native American location.

The exact boundaries run along property lines of significant properties abutting these roads and abutting the section of Lowell Street along the triangle of land once known as the Common; and along the banks of the Concord River.

The district contains very few non-contributing properties, as there has not been extensive replacement of demolished buildings.

Please refer to the attached assessor's map.
Billerica Mills
No Scale, December 1981
<table>
<thead>
<tr>
<th><strong>Inventory No:</strong></th>
<th>BIL.900</th>
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<tbody>
<tr>
<td><strong>Historic Name:</strong></td>
<td>Middlesex Canal Dam and Locks</td>
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<tr>
<td><strong>Common Name:</strong></td>
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</tr>
<tr>
<td><strong>Address:</strong></td>
<td>Faulkner St</td>
</tr>
<tr>
<td></td>
<td>Faulkner St and Concord River</td>
</tr>
<tr>
<td><strong>City/Town:</strong></td>
<td>Billerica</td>
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<tr>
<td><strong>Village/Neighborhood:</strong></td>
<td>North Billerica</td>
</tr>
<tr>
<td><strong>Local No:</strong></td>
<td>HA-9</td>
</tr>
<tr>
<td><strong>Year Constructed:</strong></td>
<td>c 1828</td>
</tr>
<tr>
<td><strong>Architect(s):</strong></td>
<td>Baldwin, Loammi; Weston, William</td>
</tr>
<tr>
<td><strong>Architectural Style(s):</strong></td>
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</tr>
<tr>
<td><strong>Use(s):</strong></td>
<td>Abandoned or Vacant; Other Industrial; Other Transportation</td>
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<tr>
<td><strong>Significance:</strong></td>
<td>Archaeology, Historic; Engineering; Industry; Transportation</td>
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<td><strong>Area(s):</strong></td>
<td>BILE: Billerica Mills Historic District</td>
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<td></td>
<td>BIL.K: Middlesex Canal</td>
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<tr>
<td></td>
<td>BIL.O: Billerica Mills Historic District</td>
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<td>BIL.P: Middlesex Canal Area</td>
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<td><strong>Designation(s):</strong></td>
<td>Local Historic District (9/24/1992); Nat'l Register District (8/21/1972); Nat'l Register District (11/10/1983); Nat'l Register District (11/19/2009)</td>
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<tr>
<td><strong>Building Materials(s):</strong></td>
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The Massachusetts Historical Commission (MHC) has converted this paper record to digital format as part of ongoing projects to scan records of the Inventory of Historic Assets of the Commonwealth and National Register of Historic Places nominations for Massachusetts. Efforts are ongoing and not all inventory or National Register records related to this resource may be available in digital format at this time.

The MACRIS database and scanned files are highly dynamic; new information is added daily and both database records and related scanned files may be updated as new information is incorporated into MHC files. Users should note that there may be a considerable lag time between the receipt of new or updated records by MHC and the appearance of related information in MACRIS. Users should also note that not all source materials for the MACRIS database are made available as scanned images. Users may consult the records, files and maps available in MHC’s public research area at its offices at the State Archives Building, 220 Morrissey Boulevard, Boston, open M-F, 9-5.

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FORM F - STRUCTURE
Massachusetts Historical Commission
80 Boylston Street
Boston, Massachusetts 02116

Assessor's number USGS Quad Area(s) Form Number
Plate 10 Billerica B 901-900

Town Billerica, Massachusetts
Place (neighborhood or village) Billerica Mills
Historic District, North Billerica
Address or Location Milldam crossing Concord River at Faulkner Street Bridge
Name Milldam

Ownership □ Public □ Private

Type of Structure (check one):
□ canal □ powderhouse
□ dam □ carousel
□ fort □ boat or ship
□ gate □ street
□ kiln □ tower
□ lighthouse □ wall
□ pound □ windmill
□ tunnel □ other (specify)

Date of Construction 1828

Source Lower Merrimack River Valley: An Inv. of Hist. Eng. and Ind. Sites, Editor Peter Molly, 1976

Architect, Engineer or Designer Middlesex Canal

Proprietors

Material(s) Cut Stone, Masonry Dam

Alterations (with dates) 1950-1960 Wood Fishway filled with cement. Waste Gates and Flash Boards replaced frequently until about 1950

Condition Appears to be good

Moved □ no □ yes Date __________

Acreage Less than one acre

Setting North of Faulkner Street Bridge, the milldam is the centerpiece of the Billerica Mills Historic District

Recorded by Alec Ingraham, Assoc. Member
Organization Billerica Historical Commission
Date (month/year) June 17, 1994

Follow Massachusetts Historical Commission Survey Manual instructions for filling this form.
DESIGN ASSESSMENT  □ see continuation sheet
Describe important design features and evaluate in terms of other structures within the community.

Although not an engineer, I can provide a summary opinion. The milldam is of cut stone construction, held tight by mortar. A wooden fish ladder on the east end has been filled with concrete obscuring the original appearance. Waste gates are situated at the west end and appear to be made of metal. One gate is shut, the other is jammed open with what seems to be a barrel. The stones forming the cap sill are more finished than those below. The milldam is approximately 150 feet in length and supports an 11 foot fall. On the west side can be seen the intake mechanism for the Talbot Mills and to the east that of the Faulkner Mills. This dam is the largest in Billerica and supplied water and power for early development of industry, the Middlesex Canal, and later the Faulkner and Talbot woolen mills.

HISTORICAL NARRATIVE  □ see continuation sheet
Explain the history of the structure, and how it relates to the development of the community.

In 1708 Christopher Osgood was granted approximately 40 acres of land on the west bank of the Concord River in Billerica. In exchange he agreed to construct a milldam to provide power for a grist mill to grind grain for the citizens of the area. By 1711 the dam was complete and the mill operable. Roger Toothaker, who owned land opposite the dam, was the first to receive relief from flowage, receiving land in another section of the Town. Other farmers residing upstream in Concord and Sudbury were less fortunate. Numerous cases brought against the dam owner(s) by agrarian interests resulted in failed attempts to have the structure removed. The original milldam zig-zagged across the river taking full advantage of all natural obstructions. Within a short time, Osgood added a sawmill and William Chandler from Andover began an unsuccessful venture at establishing a fulling mill nearby. After Osgood's death in 1739, many small enterprises began to occupy the east and west banks of the river. The mill privilege was sold and divided. By 1784 Thomas Richardson, an entrepreneur, had reunited most of the privilege and maintained sizeable holdings in the area. These he sold along with the rights to the dam and water and the obligation to grind grain to the Middlesex Canal Proprietors in 1794. The land and water rights were important to the Canal Company. The Concord River was the highest point of land between the Merrimack River and Charlestown. The milldam was used to divert waters from the Concord into the Canal and the Richardson holdings, including a foundry, were employed to prepare materials for use in the construction of the Canal. By 1798, Osgood's dam proved leaky and unsatisfactory. The wooden structure tightened with gravel was subject to frequent failure. This prompted the

BIBLIOGRAPHY and/or REFERENCES  □ see continuation sheet

The contents are summarized from a paper written for the Billerica Historical Society. In addition it was prepared with the assistance of noted Billerica Historian Dr, Charles E. Stearns.

□ Recommended for listing in the National Register of Historic Places. If checked, you must attach a completed National Register Criteria Statement form.

The Milldam is the centerpiece of the Billerica Mills District which is on the National Register.
Proprietors to erect a new wooden box dam filled and tightened with gravel. Loammi Baldwin, celebrated engineer, canal director, and inventor of the Baldwin apple, supervised the construction. By 1828 this structure proved inadequate and the Proprietors, under the direction of Caleb Eddy, built a masonry dam which is substantially in place today. With the development of the railroad the Canal Company began to fail. Despite the Faulkner's presence in the area dating from 1811, the Talbot brothers purchased the property and mill privilege from the Proprietors in 1851. They successfully defended their rights to maintain the milldam at its present height against the farmers who resided upstream and claimed the dam caused their land to be flowed by the river waters. Although suits earlier had been levied against the Canal Company, the Canal Charter had afforded special provisions against liability caused by flowage. Many believed the Talbots would lose the cases; however, they won, securing the successful development of the Faulkner Woolen Mills and the Talbot Woolen Mills. Both played a prominent roll in the establishment of the mill village in North Billerica and dominated the area until the middle of the century. The Talbot property was purchased in the 1960's by CRT corporation, which now holds the mill privilege and is responsible for the dam. The obligation to grind grain was revoked by the Town in 1864. The mill buildings are now subdivided and tenant occupied. On the other shore, the Faulkner Mills closed in the 1980's and the buildings are currently unoccupied.
#601 TALBOT MILLS COMPLEX
#636 JOEL DIX HOUSE
#701 FAULKNER MILLS COMPLEX
#702 FAULKNER KINDERGARTEN
#703 FAULKNER HOUSE
#704 WILLIAMS (DESTROYED)

MANY INVENTORIED PROPERTIES # 'ERD

PORTION OF PLATE #10

Mary S. Clarke, Guide to the Middlesex Canal, 1793-1893 (Middlesex Canal Association, 1937)

J. W. Meader, The Merrimack River (Boston, 1871)

Christopher Roberts, The Middlesex Canal, 1793-1860 (Cambridge, Mass., 1938)

The Middlesex Canal was built during the years 1793-1803 under the direction of Loammi Baldwin, Sr., with the English engineer William Weston acting as a consultant during the years of construction. The canal ran from what is now Lowell, through Chelmsford, Billerica, and Woburn to Charlestown, a distance of over 27 miles. The canal operated until 1853, when competition from the railroads forced its closure. Its original 20 locks, 8 aqueducts and 48 bridges have been almost totally destroyed, and the canal bed itself has been filled in or else is badly deteriorated.

The major structures which survive are the Shawsheen Aqueduct in Billerica, the rebuilt (1937) Maple Meadow Aqueduct in Wilmington, and a fragment of the locks and dam at North Billerica. The canal was a major factor in the industrialization of New England, and a key to the growth of the textile industry in Lowell. The canal was also an important source of water for the city of Lowell, which is located at the highest point in the canal's course, 107 feet above the tide level at Charlestown and 25 feet above the Merrimack River. The canal bed itself has been filled in or else is badly deteriorated.

The Middlesex Canal was built during the years 1793-1803 under the direction of Loammi Baldwin, Sr., with the English engineer William Weston acting as a consultant during the years of construction. The canal was a major factor in the industrialization of New England, and a key to the growth of the textile industry in Lowell. The canal was also an important source of water for the city of Lowell, which is located at the highest point in the canal's course, 107 feet above the tide level at Charlestown and 25 feet above the Merrimack River. The canal bed itself has been filled in or else is badly deteriorated.
In the year 1857, the owners of the Talbot and Faulkner Woolen Mills in North Billerica purchased the Canal Company. The purchase allowed them to use the water for running their water wheels and turbines.

The continuation of the Canal on the River's east bank was a floating towpath which allowed barges to pass from the west side of the Concord to the continuation of the Canal on the River's east bank. A landing was provided at the mill yard, which was later named the Concord River millpond. A floating towpath, now removed, allowed the barges to be hauled across the Concord River millpond.

In North Billerica, on the east bank of the Concord, a mill site was purchased from the Canal Company in 1857. The Talbot Mill yard was part of the lock which allowed barges to pass from the west side of the Concord to the east side of the town. The mill was built on the site of the old mill and replaced the wooden structure with a stone mill.

The mill was later purchased by the owners of the Talbot and Faulkner Woolen Mills in 1857. The mill was used for running their water wheels and turbines. The mill was later named the Concord River millpond. A floating towpath, now removed, allowed the barges to be hauled across the Concord River millpond.
November 18, 2014

The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth

Eric Hutchins
Massachusetts Historical Commission
National Oceanic and Atmospheric Administration
National Marine Fisheries Restoration Center
55 Great Republic Drive
Gloucester, MA 01930-2276

RE: Concord River Diadromous Fish Restoration Project, Talbot Mills Dam Feasibility Study, Faulkner and Pollard Street, Billerica, MA. MHC # RC.57226.

Dear Mr. Hutchins:

Staff of the Massachusetts Historical Commission (MHC) have reviewed the Project Notification Form (PNF) and State Archaeologist’s permit application to conduct a historic and archaeological reconnaissance survey, prepared by the PAL, received November 12, 2014, for the project referenced above. The proposed project consists of the preparation of a feasibility study for the modification or removal of the Talbot Mills Dam in Billerica. A copy of the feasibility study, including scaled existing and proposed conditions project plans, should be provided to the MHC when it is available.

The MHC notes that the project includes participation by federal agencies, including the National Oceanic and Atmospheric Administration (NOAA) and the US Fish & Wildlife Service. The project may also require permitting by the US Army Corps of Engineers. Please clarify if NOAA intends to act as the lead federal agency for the project (36 CFR 800.2(a)(2)).

Potentially interested or consulting parties include the Billerica Historical Commission, Billerica Historic District Commission, Middlesex Canal Association, and the Middlesex Canal Commission. The MHC recommends that NOAA contact them to ascertain their interest in reviewing and commenting on the project. Copies of any written comments on the project received from these bodies should also be provided to the MHC.

A State Archaeologist’s permit has been issued to the PAL to conduct the historic and archaeological reconnaissance survey. The results of the survey should provide sufficient information for NOAA to offer a preliminary opinion of the project area of potential effect, and potential effects to significant historic and archaeological resources. Within the study area boundaries shown on the information submitted to the MHC, review of the MHC’s Inventory of Historic and Archaeological Assets of the Commonwealth identified the following resources: the Billerica Mills Historic District (MHC # BIL.E/O) listed in the State and National Registers of Historic Places and a local historic district, and the Middlesex Canal (BIL.K/O/T) including multiple historic and archaeological resources, listed in the State and National Registers of Historic Places. Historic and archaeological resources within and adjacent to the project study area in these districts also include the Middlesex Canal Dam and Locks (MHC # BIL.900/BIL.HA.8), JR Faulkner Mills (BIL.77), Faulkner Street bridge (BIL.935), Middlesex Canal Guard Lock (BIL.951) Talbot Mill Lock and Dam (MHC # BIL.HA.9), Floating Tow Path Peninsula (BIL.953/BIL.HA.39), Floating Towpath Anchor Stone (BIL.HA.40), the Call/Talbia Mills Site (MHC # 19-MD-37), Billerica Falls (19-MD-897), and Wilson Street Site (19-MD-902).

The MHC looks forward to consultation with NOAA and with other consulting parties to reach agreement to avoid,
minimize or mitigate adverse effects to significant historic and archaeological resources.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), Massachusetts General Laws, Chapter 9, Section 26-27C (950 CMR 70-71), and/or MEPA (301 CMR 11). If you have questions, please contact Jonathan K. Patton at this office.

Sincerely,

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission

xc:
Ben Gahagan, MA Div. of Marine Fisheries
Tim Binzen, US Fish & Wildlife Service
Karen Kirk Adams, USACOE-NED Regulatory
Kate Atwood, USACOE-NED
DEP-NERO, Wetlands & Waterways
DCR, Office of Dam Safety
Nick Wildman, MADFG, Division of Ecological Restoration
Victor Mastone, Massachusetts Board of Underwater Archaeological Resources
Billerica Historical Commission
Billerica Historic District Commission
Middlesex Canal Association
Middlesex Canal Commission
Deborah C. Cox, PAL, Attn: Suzanne Cherau
Jill Griffiths, Gomez & Sullivan Engineers
November 10, 2014

Brona Simon
State Archaeologist
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, Massachusetts 02125

Re: Concord River Diadromous Fish Restoration Project-Talbot Mills Dam, Billerica Historic and Archaeological Reconnaissance Survey
PAL #2929

Dear Ms. Simon:

Enclosed please find a Project Notification Form and application for a State Archaeologist’s permit to conduct a Historic and Archaeological Reconnaissance Survey for the Concord River Diadromous Fish Restoration Project-Talbot Mills Dam study area in Billerica, Massachusetts. The study area is located on the Billerica, Massachusetts USGS quadrangle. We would like to begin investigations as soon as possible. Thank you in advance for your time and attention to this matter.

If you have any questions or concerns, please do not hesitate to contact Suzanne Cherau, Principal Investigator, at your convenience.

Sincerely,

Deborah C. Cox, RPA
President

Enclosures

cc: Jill Griffiths, Gomez and Sullivan Engineers (w/o encl.)
    Eric Hutchins, NOAA Restoration Center (w/o encl.)
    Thomas Raphael, Middlesex Canal Commission (w/encl.)
    J. Breen, Middlesex Canal Association (w/encl.)
    Billerica Historical Districts Commission (w/encl.)
950 CMR: DEPARTMENT OF THE STATE SECRETARY

APPENDIX B
COMMONWEALTH OF MASSACHUSETTS

SECRETARY OF STATE: MASSACHUSETTS HISTORICAL COMMISSION
PERMIT APPLICATION: ARCHAEOLOGICAL FIELD INVESTIGATION

A. General Information

Pursuant to Section 27(c) of Chapter 9 of the General Laws and according to the regulations outlined in 950 CMR 70.00, a permit to conduct a field investigation is hereby requested.

1. Name(s): Suzanne G. Cherau
2. Institution: The Public Archaeology Laboratory, Inc.
   Address: 26 Main Street
   Pawtucket, Rhode Island 02860
3. Project Location: Concord River Diadromous Fish Restoration Project-Talbot Mills Dam
   see attached proposal
4. Town(s): Billerica
5. Attach a copy of a USGS quadrangle with the project area clearly marked.
   see attached
6. Property Owner(s): Faulkner Mills Acquisition Corp., Concord River Trust, Town of Billerica, Billerica Historical Society, Pace Industries (L&P Aluminum Holdings LLC and L&P Acquisition LLC), and CRT Development Realty.
7. The applicant affirms that the owner has been notified and has agreed that the applicant may perform the proposed field investigation.
8. The proposed field investigation is for a(n):
   a. Reconnaissance Survey
   b. Intensive Survey
   c. Site Examination
   d. Data Recovery
B. Professional Qualifications

1. Attach a personnel chart and project schedule as described in 950 CMR 70.11 (b).
   a. Personnel
      Principal Investigator(s): Suzanne Cherau
      Senior Industrial Historian: John Daly
   
   b. Schedule
      Fieldwork: November – December 2014
      Analysis: January – February 2015
      Report: March 2015

2. Include copies of curriculum vitae of key personnel (unless already on file with the State Archaeologist).

C. Research Design

1. Attach a narrative description of the proposed Research Design according to the requirements of 950 CMR 70.11.

2. The Applicant agrees to perform the field investigations according to the standards outlined in 950 CMR 70.13.

3. The Applicant agrees to submit a Summary Report, prepared according to the standards outlined in 950 CMR 70.14 by: June 30, 2015

4. The specimens recovered during performance of the proposed field investigation will be curated at:
   The Public Archaeology Laboratory, Inc.
   26 Main Street
   Pawtucket, Rhode Island 02860

SIGNATURE  
APPLICANT(S)  

DATE  
November 7, 2014
Figure 1. Location of the Concord River Diadromous Fish Restoration Project – Talbots Mill Dam study area on the Billerica, MA, USGS topographic quadrangle, 7.5 minute series.
PERMIT TO CONDUCT ARCHAEOLOGICAL FIELD INVESTIGATION

Permit Number 3511  Date of Issue November 18, 2014
Expiration Date November 18, 2015

PAL is hereby authorized to conduct an archaeological field investigation pursuant to Section 27C of Chapter 9 of General Laws and according to the regulations outlined in 950 CMR 70.00.

Concord River Diadromous Fish Restoration Project,
Talbot Mills Dam Feasibility Study, Billerica

Project Location

Brona Simon, State Archaeologist
Massachusetts Historical Commission
Brona Simon  
Massachusetts Historical Commission  
229 Morrissey Boulevard  
Boston, MA 02125

Re: Concord River Diadromous Fish Restoration Project  
Billerica Historic and Archaeological Reconnaissance Survey, PAL #2929.

November 17, 2014

Dear MS Simon:

The Permit Application: “Archaeological Field Investigation” is incorrect in that Item 6, Property Owners, is missing the Middlesex Canal Commission (MCC) which owns three quarters of the peripheral land around the Talbot Dam mill pond. See attached documents. These are more recent changes than from any previous studies conducted by PAL and consequently, also makes Item 7 incorrect.

MCC has a Phase 1, Middlesex Canal Heritage Park, Mill Pond/ Canal Project, at the 25% design stage on the NMCG TIP for construction in 2018. There are five National Register Historic Features of this project:

1. The Talbot Mills Dam
2. The north Guard Lock
3. The south Guard Lock
4. The floating towpath anchor stone
5. The floating towpath peninsular

The construction and use of these features are predicated on maintaining the water at the historical level, as marked on a metal gauge imbedded in a stone near the Faulkner Mill property.

Thus, of the three options being considered, removal of the historic dam is not an option. In addition, the option of constructing a fish way, could not alter the structure nor appearance of the historic dam, nor alter the water flow over the dam or the water level. There may be a way to design a fish way while meeting these conditions. The MCC would be glad to be consulted and consider any options.

The purpose of the Field Investigation however, considering all the previous would appear to be redundant.

Sincerely,

[Signature]

Thomas Raphael, CEO  
666 Main Street, S412  
Winchester, MSA 01890  
Tel: 781-729-3215  
thomrap@comcast.net

Enclosures, (4)

C/O NMCOG, 40 Church Street, Suite 200, Lowell, MA 01852-2686, Tel: 978-454-8021
November 20, 2014

Brona Simon
State Archaeologist
State Historic Preservation Officer
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, Massachusetts 02125

Re: Concord River Diadromous Fish Restoration Project-Talbot Mills Dam, Billerica
    Historic and Archaeological Reconnaissance Survey
    PAL #2929

Dear Ms. Simon:

Enclosed please find a revised application for a State Archaeologist's permit to conduct a Historic and Archaeological Reconnaissance Survey for the Concord River Diadromous Fish Restoration Project-Talbot Mills Dam on the Billerica, Massachusetts USGS quadrangle in Billerica, Massachusetts. The revised permit application addresses concerns raised by the Middlesex Canal Commission regarding their landholdings around the perimeter of the Talbot Dam mill pond and previously identified historic and archaeological resources (see T. Raphael letter to you, dated November 17, 2014). The project partners including the National Oceanic and Atmospheric Administration (NOAA) and the Fish and Wildlife Service of the Department of the Interior (USFWS) have requested that PAL reduce its reconnaissance survey area to the dam site and adjacent lands where access has been secured from the owners of the dam. Also, please note that these agencies are working to investigate options for fish passage and associated river restoration that minimize impacts on historical and archaeological resources at this location as part of the current feasibility analysis for fish restoration.

If you have any questions or concerns, please do not hesitate to contact Suzanne Cherau, Principal Investigator, at your convenience.

Sincerely,

[Signature]
Deborah C. Cox, RPA
President

Enclosures

cc: Jill Griffiths, Gomez and Sullivan Engineers (w/o encl.)
    Eric Hutchins, NOAA Restoration Center (w/o encl.)
    Thomas Raphael, Middlesex Canal Commission (w/encl.)
    J. Breen, Middlesex Canal Association (w/encl.)
    Billerica Historical Districts Commission (w/encl.)
A. General Information

Pursuant to Section 27(c) of Chapter 9 of the General Laws and according to the regulations outlined in 950 CMR 70.00, a permit to conduct a field investigation is hereby requested.

1. Name(s): Suzanne G. Cherau

2. Institution: The Public Archaeology Laboratory, Inc.
   Address: 26 Main Street
   Pawtucket, Rhode Island 02860

3. Project Location: Concord River Diadromous Fish Restoration Project-Talbot Mills Dam
   see attached proposal

4. Town(s): Billerica

5. Attach a copy of a USGS quadrangle with the project area clearly marked.
   see attached

6. Property Owner(s): CRT Development Realty

7. The applicant affirms that the owner has been notified and has agreed that the applicant may perform the proposed field investigation.

8. The proposed field investigation is for a(n):
   a. Reconnaissance Survey
   b. Intensive Survey
   c. Site Examination
   d. Data Recovery
B. Professional Qualifications

1. Attach a personnel chart and project schedule as described in 950 CMR 70.11 (b).

   a. Personnel

      Principal Investigator(s): Suzanne Cherau
      Senior Industrial Historian: John Daly

   b. Schedule

      Fieldwork: December 2014
      Analysis: January – February 2015
      Report: March 2015

2. Include copies of curriculum vitae of key personnel (unless already on file with the State Archaeologist).

C. Research Design

1. Attach a narrative description of the proposed Research Design according to the requirements of 950 CMR 70.11.

2. The Applicant agrees to perform the field investigations according to the standards outlined in 950 CMR 70.13.

3. The Applicant agrees to submit a Summary Report, prepared according to the standards outlined in 950 CMR 70.14 by: June 30, 2015

4. The specimens recovered during performance of the proposed field investigation will be curated at:

   The Public Archaeology Laboratory, Inc.
   26 Main Street
   Pawtucket, Rhode Island 02860

SIGNATURE: [Signature]

APPLICANT(S) [Signature]

DATE: 11/20/14
November 24, 2014

Deborah C. Cox
PAL
210 Lonsdale Avenue
Pawtucket, RI 02860

Attn: Suzanne Cherau

RE: Concord River Diadromous Fish Restoration Project, Talbot Mills Dam Feasibility Study, Faulkner and Pollard Street, Billerica, MA. MHC # RC.57226. PAL # 2929.

Dear Deborah:

Thank you for submitting a revised State Archaeologist’s permit application to the Massachusetts Historical Commission to amend State Archaeologist’s Permit #3511, received November 21, 2014, for the project referenced above. The project has been revised to include a smaller archaeological survey area in the immediate vicinity of the existing Talbot Mills Dam in Billerica.

State Archaeologist’s Permit #3511 has been amended and extended to expire on November 24, 2015, and I look forward to review of the results.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800) and Massachusetts General Laws, Chapter 9, Sections 26-27C (950 CMR 70). If you have any questions or need further information, please feel free to contact Jonathan K. Patton of my staff.

Sincerely,

Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission
December 5, 2014

Ms. Brona Simon
State Historic Preservation Officer
Executive Director
State Archaeologist
Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125

SUBJECT: Concord River Diadromous Fish Restoration Project, Talbot Mills Dam Feasibility Study, Faulkner and Pollard Street, Billerica, MA MHC #RC.57226

Dear Ms. Simon:

As outlined in the Project Notification Form submitted to the Massachusetts Historic Commission on November 10, 2014, the MA Division of Marine Fisheries is leading a preliminary feasibility study to evaluate alternatives for fish passage at the Talbot Mills Dam in Billerica. NOAA, the US Fish and Wildlife Service and the MA Department of Environmental Protection are collaborating and supporting this study as part of the Restoration Plan and Environmental Assessment for the Nyanza Chemical Waste Dump Superfund Site. The NOAA Restoration Center appreciates your recent letter which provides preliminary identification of numerous historic and archaeological resources in close proximity to the Talbot Mills Dam, as well as recommending possible interested or consulting parties. The project team will be sure to reach out to these parties and others following the completion of this preliminary feasibility study. At this stage it is our expectation that NOAA will likely play the role as the lead federal agency when this project moves beyond the feasibility study phase (36 CFR 800.2(a)(2)).

We appreciate the opportunity to work with your office on this complex and important project. If you have any questions, please contact Eric Hutchins at (978) 281-9313.

Sincerely,

[Signature]
John Catena
Northeast Regional Supervisor
NOAA Restoration Center
cc: Ben Gahagan, MA Division of Marine Fisheries
    Molly Sperduto, US Fish and Wildlife Service
    Tim Binzen, US Fish and Wildlife Service
    Karen Adams, USACOE-NED Regulatory
    Kate Atwood, USACOE-NED
    DCR, Office of Dam Safety
    Victor Mastone, MA Board of Underwater Archaeological Resources
    Billerica Historical Commission
    Billerica Historic District Commission
    Middlesex Canal Association
    Middlesex Canal Commission
    Deborah Cox and Suzanne Cherau, PAL:
    Jill Griffiths, Gomez and Sullivan Engineers MA Division of Ecological Restoration
    NOAA Federal Preservation Officer, Robert McWilliams
    Karen Pelto, MA DEP
    Rosemary Knox, MADEP