APPENDIX A

HISTORICAL AND ARCHAEOLOGICAL RESOURCES

TRC

Customer-Focused Solutions

PHASE IA STUDY FOR THE MILL RIVER RESTORATION PROJECT, STAMFORD, FAIRFIELD COUNTY, CONNECTICUT

September 2002

TRC

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PHASE IA STUDY FOR THE MILL RIVER RESTORATION PROJECT, STAMFORD, FAIRFIELD COUNTY, CONNECTICUT

Submitted to:

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I. INTRODUCTION

The Bioengineering Group, Inc., based in Salem, Massachusetts is examining aquatic ecological restoration alternatives for the lower Mill River and Mill River Pond in Stamford, Connecticut (Figure 1). The goals of the project are to improve fish migration and habitat in the Mill River, including anadromous fish spawning habitat. Depending on the alternative selected, the project may impact the Main Street Dam (Figure 2).

The project area includes the Mill River, Mill River Pond, and the Main Street Dam in Stamford, Fairfield County, Connecticut. The river section impacted is 2-miles long, including the 3.5-acre Mill River Pond.

The land surrounding the project area, between Broad Street and the Main Street Dam is city-owned parkland. This section of the river has been channelized by the construction of concrete walls along the banks north of the Main Street Dam. These walls were added as part of the original construction of the Mill River Pond and Main Street Dam in 1922. A double line of mature cherry trees, which are of cultural significance to the City of Stamford, line both banks of the river above the concrete retaining walls.

The purpose of this report is to provide a brief overview of previously identified, cultural resources that may be affected by the proposed project, as well as to assess likely cultural resource concerns or impacts for the project alternatives. No fieldwork was conducted for this study. Information for this overview draws from site visits to the dam site, initial discussions with David Poirier at the State of Connecticut Historical Commission (SCHC), and research conducted at the Connecticut Office of State Archaeology, the Connecticut State Library, and the University of Connecticut Library.

ALTERNATIVE 1 – NO RESTORATION

Under Alternative 1, no alterations to the Mill River or Mill Pond would be performed. The Mill Pond landscape would remain unchanged. Historic cherry trees and other vegetation would remain in their current locations. The concrete walls bordering the pond and dam would remain in place and require continued maintenance. Sediment deposition would continue in the Mill Pond, thus requiring regular dredging and maintenance by the City of Stamford. Water quality within the Mill Pond would continue to be impaired. The Main Street Dam would continue to block migration and movement of anadromous and freshwater fishes. Anadromous fish passage would not be restored.

ALTERNATIVE 2 – DAM REMOVAL & RIVER CHANNEL RESTORATION

To facilitate fish passage and allow continual flushing of sediment the dam would be removed under Alternative 2. A stable river that can effectively transport storm events and sediment would be re-established through the former Mill Pond. A pool riffle sequence appropriate to the

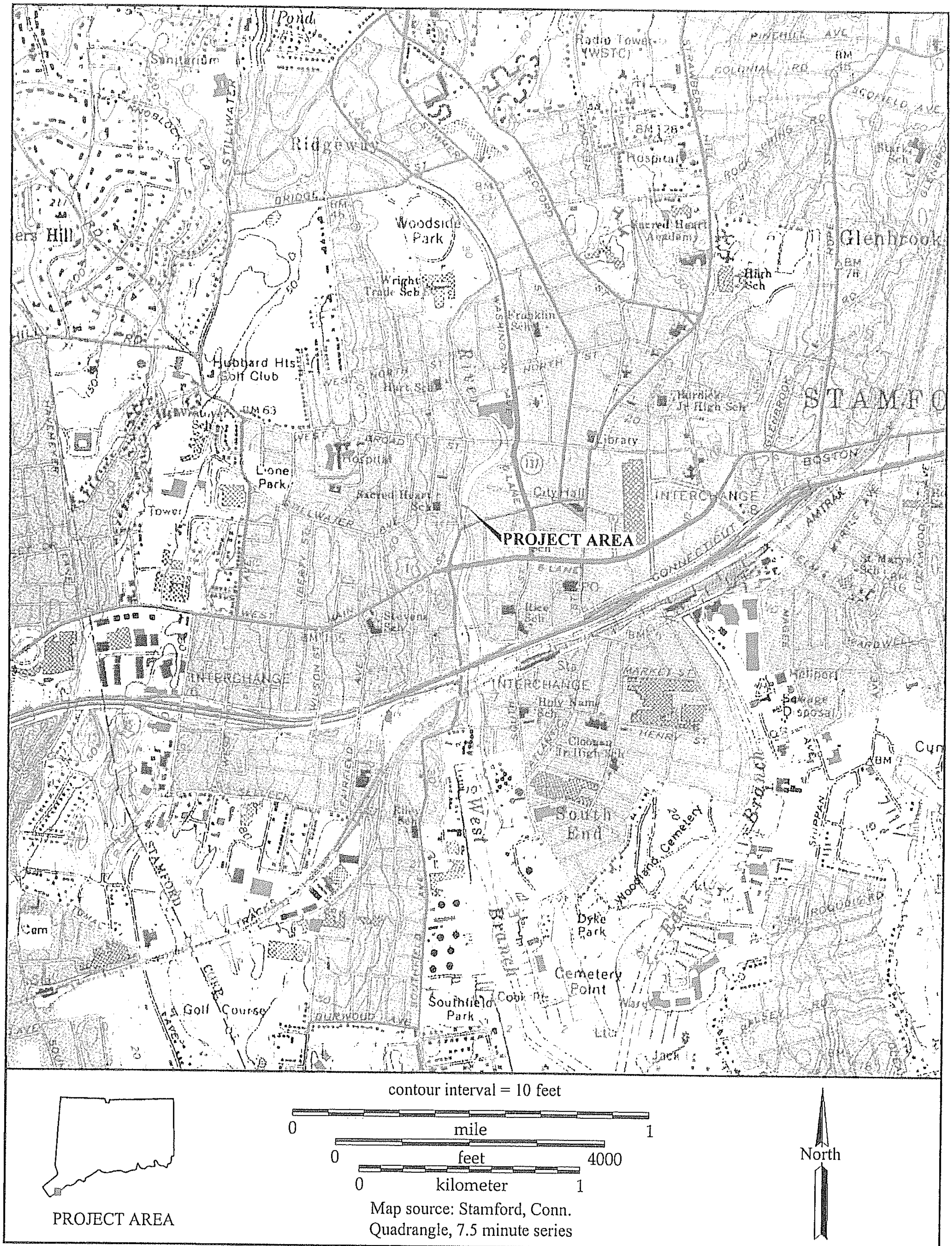

Figure 1. Location map of the project area.

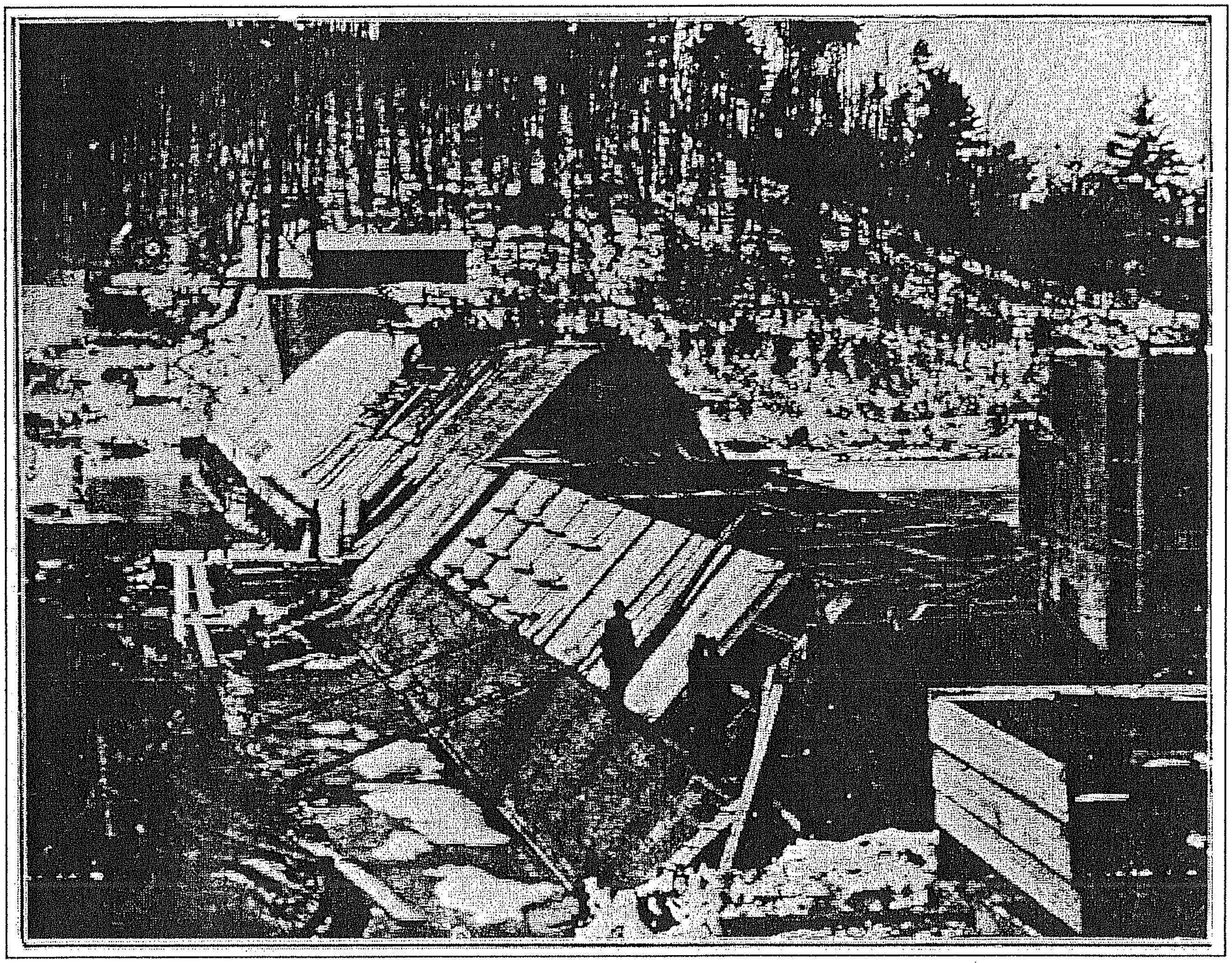

Figure 2. Photograph of a dam under construction in Schuylerville, New York, similar to the Main Street Dam, also built by the Ambursen Hydraulic Construction Company.

gradient would be constructed using native boulders, sized and placed to direct flow through the park. The pools would be self-maintained by natural flushing during high river flows. Excess sediment that had collected behind the dam would be excavated and disposed at a designated site prior to construction. The concrete walls of the Mill Pond would be removed and replaced with gently sloping banks composed of soil material stabilized by native vegetation. These vegetated banks would act as a riparian buffer providing shade. Terraces would be shaped to restore the floodplain and to store flood events without modifying FEMA flood zones.

Removal of the dam would reduce the river level in this section and require fill to be placed in the locations where the concrete walls are to be removed. Creation of flood plains and terraces may result in the removal of some existing vegetation. Select cherry trees on either bank may be preserved. Passage of anadromous and freshwater fishes would be restored to the Mill River, and habitat connectivity between the river and Long Island Sound would be reestablished. Little maintenance would be required to sustain stream channel integrity and water quality. Trails and/or boardwalks would accommodate recreation access to the river.

Additional Restoration Actions: (1, 2, 6, 7, 11, 12, 13, 17, 18, 19, 20)

- Creation of a stormwater wetland and outdoor education area on the Wright Technical School grounds.
- Incorporation of trail system to connect greenway and parks along river corridor.
- Riparian enhancement through the planting of native riparian trees.
- Removal of exotic and invasive plant species along the riparian corridor
- Tidal wetland creation and enhancement. Restoration of tidal hydrology through re-grading of banks and planting of native salt marsh vegetation.
- Removal of abandoned cement blocks and gate structures directly beneath the Pulaski Street Bridge.

ALTERNATIVE 3 – DAM REMOVAL & CREATION OF STEPPING POOLS

Under Alternative 3, dam removal would occur as described in Alternative 2. A still-water landscape would be maintained in Mill Pond Park through the establishment of a series of pools connected by small cascades. Excess sediment that had collected behind the dam would be excavated and disposed at a designated site prior to construction. The upper-most pool would be designed to retain sediment and allow easy access for sediment removal. Wetland habitat may be established along the margins of the pools. The concrete walls around the Mill Pond would be removed and replaced with vegetated banks stabilized and functioning in the same manner as describe in Alternative 2. Some of the cherry trees may be displaced in order to shape the larger bodies of water. Passage of a broad range of fish and other aquatic species would be restored to the Mill River, and habitat connectivity would be restored between the river and the ocean. Trail systems and overlooks would compliment the pool/cascade system.

Additional Restoration Actions: (1, 2, 6, 7, 11, 12, 13, 17, 18, 19, 20)

- Creation of a stormwater wetland and outdoor education area on the Wright Technical School grounds.
- Incorporation of trail system to connect greenway and parks along river corridor.
- Riparian enhancement through the planting of native riparian trees.
- Removal of exotic and invasive plant species along the riparian corridor
- Tidal wetland creation and enhancement. Restoration of tidal hydrology through re-grading of banks and planting of native salt marsh vegetation.
- Removal of abandoned cement blocks and gate structures directly beneath the Pulaski Street Bridge.

ALTERNATIVE 4 – MAIN STREET DAM IS RETAINED AND THE POND IS RESHAPED *(PRP REC. ALT.)*

The Main Street Dam and the Mill Pond would be retained. The concrete walls around Mill Pond would be removed and the shoreline of the Pond would be reshaped and regarded. The new shoreline would be vegetated with native aquatic emergent herbaceous plants, wetland shrubs, and wetland trees to enhance wetland habitat. The new pond slopes would be stabilized with native upland vegetation to develop a buffer riparian zone around the pond. Existing cherry trees may require removal or relocation, as determined by the health of the individual tree. Fish passage would be enhanced through the installation of a fish ladder at the Main Street Dam. On-going dredging and maintenance would be required to manage sedimentation within the Pond. Trails and/or boardwalks would accommodate recreation access to the Pond.

Additional Restoration Actions: (1, 2, 6, 7, 11, 12, 13, 17, 18, 19, 20)

- Creation of a stormwater wetland and outdoor education area on the Wright Technical School grounds.
- Incorporate trail system to connect greenway and parks along river corridor.
- Riparian enhancement through the planting of native riparian trees.
- Removal of exotic and invasive plant species along the riparian corridor
- Tidal wetland creation and enhancement. Restore tidal hydrology through re-grading of banks and planting of native salt marsh vegetation.
- Remove abandoned cement blocks and gate structures directly beneath the Pulaski Street Bridge.

II. ENVIRONMENTAL SETTING

PROJECT SETTING

The project tract is located within the city of Stamford in Fairfield County, Connecticut (see Figure 1). The location for the proposed Mill River aquatic ecosystem restoration is a 2-mile degraded section of the Mill River, also known as the Rippowam River, in downtown Stamford. The river section includes the Mill River Pond, a 3.5-acre impoundment behind the Main Street Dam. In the immediate vicinity of the project area, the urban area is densely populated.

PHYSIOGRAPHY AND HYDROLOGY

The project area lies in Fenneman's (1938) New England Upland section of the New England Province. The local topography is characterized by gently- to moderately-sloping ridgetop and slopes in glacial till uplands.

The project area is drained into the Mill River, which flows into Stamford Harbor. Stamford Harbor empties into the Long Island Sound and eventually the Atlantic Ocean.

GEOLOGY

The project area is underlain by bedrock of sedimentary origin consisting of Paleozoic-era rock formations of the Middle Ordovician period. Bedrock underlying the project area is the Black Hill Member of the Quinebaug Formation, which is described as gray, fine-grained, well-layered schist and granofels (Rodgers 1985).

CLIMATE

The climate of Fairfield County is predominantly continental, exhibiting humid and temperate conditions, with warm summers and cold winters, and prevailing winds from the southwest. Annual precipitation is usually about 47 inches. The growing season averages 127 days a year between the months of April and September (Wolf 1981:2).

FLORA

The project area lies in Braun's (1950) New England Section of the Northern Appalachian Highland Division of the Hemlock-White Pine-Northern Hardwood Region.

PALEOENVIRONMENT

Before the initial Paleoindian colonization of New England, the area experienced cyclic, Late Pleistocene glacial climates. As the glacial ice retreated north, a cold, dry tundra was established. Around 12,000 years ago, as reconstructed from fossil pollen samples collected from across the northeast (Bernabo and Webb 1977:90), the tundra was replaced by spruce woodland. The coincidental appearance of spruce across the Northeast indicates "a climatic amelioration…that allowed spruce to grow in regions where it was previously limited by climate" (Davis 1983:179). The changes in the pollen record during this period were broad and rapid. This trend in the pollen record continues until 7,000 B.P., when the remnants of the continental glacier that had lingered south of Hudson Bay finally melted. After this occurrence, both the speed and the magnitude of changes in the pollen assemblages decreased (Bernabo and Webb 1977:90).

Although some investigators have attempted to identify the spruce woodlands of the Late Pleistocene–Early Holocene as an unproductive environment that would have limited the potential for human colonization (Fitting 1968; Ritchie and Funk 1971), more recent palynological studies have suggested otherwise (Snow 1980:166). Davis (1983:176) notes that, "even at sites where the pollen influx indicates the presence of spruce trees, the continuing presence of herb pollen in high percentages suggests a partially open vegetation, not a closed forest like the modern boreal forest in Canada."

Davis (1983:176) also indicates that, "about 10,000 years ago, forests of variable composition developed in the North, and forests underwent a series of changes as new species migrated northward." Changes in the distribution (in range and in altitude) of white pine and hemlock led Davis to suggest the following climatic trends:

> The opening of the Holocene at about 10,000 years ago was marked by a change to essentially modern climate (though not of vegetational composition). Soon afterward, at least by 9000 B.P. the climate became warmer than today. Temperatures warmer than present appear to have persisted until the time of the Little Ice Age (A.D. 1450–1850) [Davis 1983:176].

A number of temperate forest species were also present at the opening of the Holocene, and the range of these trees soon expanded northward. The earliest Holocene forests included oak, elm, ash, birch, ironwood, and sugar maple (Davis et al. 1980:174). Davis (1983:174) has described the pollen assemblage for the early Holocene as resembling modern assemblages from the northern Great Lakes region. Significantly, ironwood was present at higher percentages than at any later time. Its presence "suggests a forest with a diffuse canopy and well-lighted forest floor" (Davis 1983:174). These early forests, however, lacked chestnut, hickory, and red maple, which became dominant in late Holocene forests. With their importance as a food source to contemporaneous populations in other areas, particularly the Southeast, the slow migration of nut-bearing trees into the region is perhaps one of the most significant factors affecting both human and animal populations.

The modern vegetation patterns in the Northeast include a pine-dominant conifer/hardwoods region in the northern sections, and oak-dominant, deciduous forests in the southern portions. The modern ecotone extends from southern Maine west along the Massachusetts/Vermont border, then southwest across southern New York, and then west across northern Pennsylvania to

Lake Erie. All of Connecticut is included in the deciduous zone, and the pollen records indicate that the ecotone between the two major zones was established as early as 7,000 B.P. Bernabo and Webb (1977:90) caution that, although the ecotone was stable from that period, the species composition of the forest has continued to change for several millennia.

III. CULTURAL BACKGROUND

PREHISTORIC PERSPECTIVE

Paleoindian Period (ca. 12,000–9,500 B.P.)

The Paleoindian period represents the earliest human occupation in the northeastern United States. This occupation began in the Late Pleistocene, soon after the continental ice sheet began to recede northward, once again exposing land. The placement of these occupations in the terminal Pleistocene epoch indicates an adaptation to cooler climatic conditions and a different physiographic regime than those found in the modern Holocene.

Over the next 4,000 years, the ice melted and retreated northward toward Canada, exposing the land surface of most of New York and New England in the process. The new landscape was dotted by post-glacial lakes, which changed size and shape relatively quickly as the surface of the land adjusted to the loss of pressure from the ice sheet (Isachsen et al. 1991:178–179). During this time, approximately 12,000 to 13,000 years B.P., humans began moving into northeastern North America.

Aboriginal groups of the period were likely small, mobile bands dependent upon a hunting and gathering economy. Although they may have hunted some of the megafauna that became extinct at the end of the Pleistocene, such as mastodon *(Mammut americanum),* bison *(Bison bison antiquus)*, and ground sloth (*Megalonyx* sp.), it is likely that the subsistence base varied and included a number of plant and animal foods. West of the Mississippi River, the association between fluted points and extinct Pleistocene megafauna has led to the notion of Paleoindians being "big game hunters." However, the small number of associations in the eastern United States has led many to question the importance of the megafauna in the subsistence of Paleoindians (McNutt 1996:189).

The oldest evidence of human occupation in the Northeast comes from the sites and assemblages associated with the Paleoindian Bull Brooke phase, which dates ca. 10,600–10,200 B.P. These sites include Bull Brook, Bull Brook II, and Wapanucket #8 in Massachusetts, and the Whipple site in southwestern New Hampshire (Curran 1999). One undisturbed Paleoindian site in Connecticut, 6LF21, was excavated in 1977 and produced the only radiocarbon date for this period in the state (10,190 B.P.). The remainder of the evidence for Paleoindian occupation in Connecticut comes from isolated finds of local variants of the fluted point tradition known as Clovis, which occur in scattered locations around the state. Many of these finds appear to be associated with former post-glacial lake basins (Lavin 1984). In particular, surveys by the American Indian Archaeological Institute (AIAI) near Robbins Swamp, located along the Housatonic River in Canaan, Connecticut, have identified numerous Paleoindian sites around the margins of this rich, ecological zone (Nicholas 1988). Although several of the sites have produced fluted points, the results of more detailed investigations are not yet available.

Archaic Period (ca. 9,500–3,000 B.P.)

The Archaic period is subdivided into the Early, Middle, Late, and Terminal Archaic. Current archaeological evidence suggests that the youngest fluted point sites date to no later than approximately 9,500 years ago, marking the beginning of the Early Archaic. The Early Archaic period is not as poorly represented in the archaeological record as the preceding Paleoindian period. Most of the Early Archaic sites have been identified by the presence of projectile points analogous to dated types found in stratified Southeastern sites. Moeller (1984:49) describes what he terms a "surprising abundance of apparently Early Archaic projectile points from surface collections in western Connecticut, including bifurcates, Kanawha, Kirk, and Palmer types." A majority of these sites are located on uplands.

Although projectile points similar to southeastern Middle Archaic types had been found in isolated contexts throughout the Northeast, clear identification of the chronological position of the northern analogs was not established until Dincauze (1971, 1976) reported on the excavations at the stratified Neville site on the Merrimack River in New Hampshire. These excavations documented the existence of the Neville-stemmed point type dating between about 7,800 and 7,000 B.P., and the Stark-stemmed projectile point dating between about 7,600 and 6,400 B.P. (Dincauze 1976). In addition, the Merrimack point type was identified as dating to the end of the Middle Archaic period. The Neville and Stark point types are similar in style and age to the Stanly and Morrow Mountain types that Coe (1964) defined earlier in the Southeast. The Neville and Stark points have proven to be relatively common across New England.

Research in the Connecticut River Valley by the Public Archaeology Survey Team has uncovered a number of Middle Archaic components. The Dill Farm site in East Haddam has yielded dozens of Neville and Stark points, as well as narrow-stemmed points that McBride (1984a:56) describes as "Merrimack-like." The Dill Farm site produced a radiocarbon date of 8,050 B.P. in general stratigraphic association with the Neville and Stark points.

The accumulated data for the Middle Archaic period in the Northeast suggests that its inhabitants were forming distinct bands and settling into defined territories. These bands were establishing base camps and were occupying a greater variety of special purpose sites in a carefully planned seasonal round (Snow 1980:183). Evidence for the first use of coastal resources, such as shellfish, dates to this period; however, intensive exploitation of this resource base did not occur until the Late Archaic period. Several new tool types were developed during this period, including woodworking tools such as gouges and axes, and large ground stone, semi-lunar knives. The adaptive strategy employed during this period is generally perceived to have been a diffuse adaptation, oriented towards generalized hunting and gathering, and the seasonal exploitation of resources (Dincauze and Mulholland 1977:441; McBride 1984b:96, 238). According to Dincauze (1974:45), the preference for riverine, lacustrine, and bog settings during the Middle Archaic suggest an orientation toward the exploitation of anadromous fish runs in the spring and eastern flyway bird migrations during the spring and fall.

Throughout the Northeast, archaeologists recognize the Late Archaic period as one in which the numbers and types of sites increase dramatically—what Snow (1980:187) describes as the Late Archaic "florescence." Unlike with earlier time periods, interpreters of Late Archaic assemblages have to contend with a sometimes confusing and complex array of data. In New York, Ritchie recognized two major Late Archaic components, the Lamoka and the Laurentian, which can overlap in time and space. The Lamoka tradition is associated with the small, narrow-stemmed projectile points that are found across New England, such as the Sylvan, Wading River, and Squibnocket types. Snow (1980:226) calls the Laurentian complex and its related assemblages in northern New England and the St. Lawrence drainage the "Lake Forest Archaic," and the Lamoka/Sylvan/Squibnocket complexes of central and southern New York and New England the "Mast Forest Archaic." Pfeiffer (1984) has compiled evidence that the Lake Forest Archaic in Connecticut is a widespread tradition firmly dated to the period between 5,000 and 4,200 B.P. Pfeiffer (1984:85) notes that the "Late Archaic period also witnessed an increase in the importance of gathering activities, the employment of storage, and an expanded duration of settlement."

McBride (1984b) has designated those elements of the Lake Forest tradition that occur in southern New England as belonging to the Golet phase, which he considers to be a local or regional variation. Brewerton and Vosburg projectile point are well represented in the artifact collections across Connecticut. McBride states that Lake Forest populations likely consisted of small, mobile bands exploiting a broad range of ecozones and resources (McBride 1984b:249, 252; McBride and Dewar 1981:48). He describes Brewerton sites in eastern Connecticut as being evenly distributed between riverine and nonriverine areas, with a dispersed settlement pattern and limited evidence of seasonal aggregations. If aggregations did occur, he believes it is likely that the groups either were small or did not remain for long periods of time (McBride 1984b:252).

Pfeiffer (1984:76–77), however, contends that the Lake Forest inhabitants may have been sedentary and perhaps territorial. This assertion is based on evidence that he collected from a Lake Forest component at the Bliss site in Old Lyme, Connecticut. Structural outlines, compact living floors, and elaborate mortuary ceremonialism were associated with an artifact assemblage containing many of the traits included in Ritchie's (1980) attribute list for the Laurentian tradition. Pfeiffer (1984:77) suggests that the subsistence during the Lake Forest Archaic was based on a specialized or focal adaptive strategy, consisting primarily of year-round hunting, with fishing and plant gathering occasionally contributing to the diet.

In addition to the Lake Forest assemblages, Connecticut also has widespread and long-term evidence of Snow's Mast Forest tradition—what other researchers have often called the "Narrow-Stemmed" or "Narrow Point" tradition. Mast Forest Archaic sites are numerous and occur in a wide variety of local settings (Snow 1980:230). The settlement consists of the "centrally-based wandering" of highly territorial groups (Dincauze 1974:48; 1975:25; McBride 1984a:65, 1984b; Snow 1980). Population aggregations occurred along major drainages and interior wetlands, moving among habitation sites according to seasonal availability of resources. Mast Forest site distribution in the lower Connecticut River Valley suggests an increase in the frequency and size of sites utilized as base camps, seasonal camps, and special purpose camps (McBride and Dewar 1981:48). The subsistence base probably consisted of a generalized, or diffuse adaptation, with the predominant food source being the white-tailed deer (Dincauze 1974, 1975; McBride 1984b).

The final Archaic period also has been called the Transitional period, in reference to its presumed transitional status between the Archaic and Woodland periods. Since research has continued to indicate that there is actually a great deal of cultural continuity between the Archaic and Woodland periods, Snow (1980:235) has suggested that the label "Terminal Archaic" is more appropriate. In southern New England, the Susquehanna tradition (broad-stemmed projectile points and their associated assemblages) marks the early part of the Terminal Archaic. These points include a number of regional varieties, including the Genesee, Perkiomen, Snook Kill, and Susquehanna Broadspear types. Characteristics of the Susquehanna tradition include a marked preference for a riverine adaptation and a predilection for the fine-grained lithic resources of the Piedmont province, including rhyolite, felsite, argillite, and slate (Dincauze 1975:27; Turnbaugh 1975:54). The shift in settlements from inland wetlands to riverine zones coincides with an inferred economic shift from a diffuse adaptation in the interior to a focal adaptation in the floodplain locales.

The latter half of the Terminal Archaic period is marked by the appearance of narrow, tapered Orient Fishtail projectile points. Another hallmark of the Terminal Archaic period is steatite-cooking vessels. The existence of these large steatite vessels suggests that the "people who made, traded, and used them had reached a point in the evolution of their settlement and subsistence systems where the use of heavy cooking vessels was advantageous" (Snow 1980:240). This implies that people lived in more sedentary settlements and utilized foodstuffs that required long processing with heat.

Pfeiffer (1984) has labeled the corresponding tradition in Connecticut as the "River Plain Tradition," which is derived from its apparent settlement pattern focus along the floodplains of the major river systems. Radiocarbon dates for this tradition place it between 3,600 B.P. and 2,700 B.P. Pfeiffer (1990) describes it as the direct descendant of the Late Archaic Lake Forest adaptation of southern New England. McBride (1984b) does not recognize a chronological distinction between the various Terminal Archaic projectile points in the Lower Connecticut River Valley, but instead defines the Salmon Cove phase as the only phase of the Terminal Archaic present within this region.

Woodland Period (ca. 3,000–450 B.P.)

Like the Archaic period, the Woodland period is also divided into four subperiods: the Early, Middle, Late, and Final Woodland.

McBride (1984b) has defined the Early Woodland period (ca. 3,000–2,000 B.P.) in the lower Connecticut River Valley as the Broeder Point phase. He considers this phase to be a continuation of the Narrow Point tradition; it is characterized by Meadowood, Lagoon, Rossville, and a variety of narrow points, as well as side-notched points. Other attributes of this phase include thick, grit-tempered interior cord-marked, exterior smoothed or cord-marked ceramics (Vinette I) and a quartz cobble lithic industry. The limited evidence available suggests a settlement pattern consisting of "a high percentage of seasonal camps, in a widely dispersed pattern along the river, its terraces, and upland/interior zones" (Juli and McBride 1984:95). Some evidence of a population decline in the region exists for this time period (Hoffman 1985). Subsistence data from Martha's Vineyard for the Early Woodland period indicates hunting and an extensive dependence on shellfish, including clams, oysters, and scallops (Ritchie 1969:87, 224). The Early Woodland inhabitants of Connecticut do not appear to have participated in the Adena trade network.

Two Middle Woodland phases have been identified: the Roaring Brook phase (ca. 2,000–1,250 B.P.) and the Selden Creek phase (ca. 1,250–1,000 B.P.). The Roaring Brook phase is characterized by a continuation of the quartz cobble lithic industry and an increase in the utilization of nonlocal materials. Other attributes include rocker and dentate-stamped ceramics. The Selden Creek phase is identified by ceramics of the Sebonac phase of the Windsor tradition.

Site distribution during the Middle Woodland period exhibits a significant rise in frequency and occupation area, with particular increase in coastal/riverine locations and a corresponding decrease in upland base camps (Lavin 1988a:110; McBride 1984b 135, 306–315; McBride and Dewar 1981:49). McBride's research in the Connecticut River Valley suggests that, by the end of the Middle Woodland period, "major subsistence and settlement changes were taking place as people began to aggregate along major rivers for the entire year" (Juli and McBride 1984:96). Subsistence during the Middle Woodland period of southern New England consisted primarily of a hunting, fishing, and collecting economy, with shellfish comprising a significant part of the diet for the inhabitants of coastal sites (Ritchie 1969:227).

During the Late Woodland period (ca. 1,000–450 B.P.), the antecedents of the historically-recognized Native groups become recognizable. Algonkian speakers occupied Southern New England, including Connecticut. Late Woodland-period characteristics include increased villages sizes, increased sedentism, increased trade networks, and the utilization of cultigens such as maize, squash, and beans. The Late Woodland period in Connecticut is recognized by two major ceramic traditions: the East River tradition in the western part of the state and the Windsor tradition in the eastern part of the state. Extending from 1,200 to 450 B.P., the Selden Creek phase in Connecticut covers the latter part of the Middle Woodland period and the entire Late Woodland period (McBride 1984b:134). Distinguishing trademarks of this phase include Levanna and Madison projectile points and an increased use of nonlocal lithic material. Other characteristics of the Selden Creek phase include a highly variable ceramic assemblage that includes plain, cord-marked, fabric-impressed, brushed, stamped, and incised surface decorations.

The overall increase in site frequency, size, and length of occupation for sites in the Late Woodland period continued, with the largest sites located in coastal and estuarine settings (Lavin 1988b:110; McBride 1984b:320, 324). Settlement patterns in the lower Connecticut River Valley were characterized by semi-sedentary villages or base camps located on floodplains or terraces immediately adjacent to major drainages, with temporary and task-specific camps located in the uplands (McBride 1984b:139, 322–330; McBride and Dewar 1981:49).

The subsistence system of the Late Woodland period included hunting terrestrial animals and migratory fowl, fishing, shellfish collecting, and gathering wild plants (McBride 1984b:325). In addition, cultivated foods such as maize, beans, and squash became a part of the subsistence regime for the first time in pre-history. The earliest radiocarbon dates in the Northeast for the presence of cultigens are ca. A.D. 1100 (Mulholland 1988:146), and evidence for the exploitation of these cultigens is not abundant before the Final Woodland period, ca. A.D. 1500 (McBride and Dewar 1987:305). In addition, the earliest dates are generally associated with inland sites.

The Final Woodland period (ca. 450–317 B.P.) is identified in the Lower Connecticut River Valley by the Niantic phase. The Niantic phase consists of a ceramic assemblage composed primarily of stamped, stamp and drag, linear dentate, and punctuate surface decorations (McBride 1984b:146). Diagnostic projectile points include Levanna and Madison types, with a lithic assemblage comprised mainly of Hudson valley chert.

Settlements of the Final Woodland period were similar to the preceding period, and were characterized by large permanent and semi-permanent settlements in riverine areas, with small seasonal camps and a high frequency of task-specific camps located in the uplands; no temporary sites have been identified for this period (McBride 1984b:146, 337–341). With the exception of the intensification of horticulture, there were no significant changes in the subsistence economy of the Final Woodland period.

The pre-history of Connecticut came to a close as contacts with Europeans were established in the late sixteenth and early seventeenth centuries. Native American occupations after establishment of the first permanent European settlement in 1633 have been designated by McBride (1984b) as the Hackney Pond phase. This phase was defined on the basis of a reemergence of the quartz cobble lithic industry with a corresponding decrease in the reliance on non-local material, and the presence of Guida-stamped and incised and Shantok tradition ceramics (McBride 1984b:154–155). Other traits of the Hackney Pond phase include European trade goods represented in some, but not all, of the artifact assemblages, and a settlement system similar to the preceding phase, with the exception of the intensification of small seasonal camps located in a variety of environmental zones and predominating in upland areas near extensive wetlands (McBride 1984b:154–156, 351–359). Ethnohistoric research indicates that these small, highly variable occupations can be related to camps associated with basic subsistence units of nuclear and extended families (McBride and Bellantoni 1982).

HISTORICAL OVERVIEW

Fairfield County, located in southwestern Connecticut and settled in 1639, is one of the oldest counties in the United States. At the time of its formation, Fairfield County was made up of the towns of Greenwich, Fairfield, Norwalk, Stamford, and Stratford. These towns were predominately farm oriented until the early nineteenth century (Wolf 1981). With the improvement of farmland and an increase in population in Connecticut throughout the 1700s, close to 80 percent of Connecticut forests had been cleared for agriculture by 1800. A considerable amount of timber was exported to other states or sold abroad as ship timber. Between 1810 and 1840, commercial agriculture increased and industry moved into the state. The additional demands for lumber to support the developing rail systems across the state depleted the remaining virgin forest. By the 1840s, the rail system was well developed and western states began to compete successfully for the agricultural markets in the east. By 1860, many New England landowners began migrating west. This migration, coupled with the increased competition from industry for available labor, resulted in the decrease of maintained farmland from 1,600,000 acres in 1880 to 700,000 acres in 1920. With farmland lying fallow, natural reforestation occurred over the next 50 years (Ilgen 1966).

The area of Stamford, originally known as Rippowam, was purchased from the aboriginal inhabitants of the area in July 1640. The transaction was recorded, and the deed was signed by members of the Shippan and Toquam tribes, and Nathaniel Turner of the New Haven Colony. The purchase price of the land was 12 each of, coats, hoes, hatchets, glasses, and knives, two kettles, and four fathom of white wampum (Cslib.org 1a). The deed included all but 20 acres of land for the natives to plant corn, beans, and squash. Members of the Wethersfield Colony purchased the land from Turner and the New Haven Colony in October 1640 (Feinstein 1999).

The conditions of the sale were recorded again in 1655 in a deed titled "Deed Renewal by Ponus and Onax." Later in 1667, Taphance, the son of Ponus, and Powahay, the son of Onax, signed another agreement, again relinquishing all rights to the land, except their 20 acres. Additional conditions of the deed would return the 20 acres to Stamford if the Indians left their land. Again in 1701, another paper was recorded that confirmed the previous grants and relinquished all rights of the Indians to all lands (Cslib.org 1a).

The aboriginal inhabitants of Stamford, having little cultural equivalent of the European's "land ownership," misunderstood the terms and the spirit of the original deed signed in 1640, and perhaps even the subsequent deeds recorded over the next 61 years. It's fairly plausible the native inhabitants saw the goods the European's considered the "purchase price" of Stamford, as merely tribute paid for the temporary use of their territory.

Stamford remained mostly agricultural until the 1800s when industry began developing along the coastline. It was the opening of Stamford as a regular stop on the New York, New Haven, and Hartford Railroad in 1848 that was the catalyst to increase of population in Stamford (Feinstein 1999). Two years after the opening of the rail line to Stamford, the population was 5,000. A mere 30 years later, the population had more than doubled, to well over 11,000 (Cslib.org 1a).

A large percentage of this population increase during the mid-nineteenth century came from Irish immigration into Stamford. The influx of Irish into the area coincided with the potato famine in Ireland that began in 1845. A fungus, Phytophthora infestans, that quickly reduced the potato crop to a rotted compost, caused the famine. The blight wiped out the potato crop in 1845, 1846, and again in 1848. People were left with nothing to eat and no means of making money to support themselves. Those who could afford to, left the country in search of a better life. It is estimated that as many as 250,000 people a year emigrated from Ireland during, and immediately after, the potato famine.

By the late 1880s, social and political turmoil in Europe led to a new wave of immigrants into Stamford. Large portions of the new settlers were from Italy, Germany, and Russia, although there were considerable numbers from the rest of Europe as well (Feinstein 1999). Between 1900 and 1910, Stamford was one of the fastest growing cities in the state. During the first decade of the twentieth century, Connecticut's population increased by 23 percent. During the same period, Stamford's population increased 53 percent. By this time, Stamford's population was fully one third foreign born (Cslib.org 1b).

As the nineteenth century gave way to the twentieth, Stamford, along with the rest of the country, became increasingly industrialized. It was the pool of cheap, immigrant labor that allowed many Stamford companies to prosper and expand during this time. Between the period of 1900 to 1910, as the size of the labor force doubled, manufacturing businesses increased from 49 to 86, and the value of the goods produced increased 123 percent (Cslib.org 1b).

The stock market crash of 1929 and the Great Depression of the 1930s took its toll on the City of Stamford and its residents. By 1929, the population of Stamford was more than 56,000. More than 10,000 people worked in one of the 118 manufacturing plants, producing products valued in excess of 40-million dollars annually. By 1934, the number of manufacturing facilities dropped to 40, and the value of the goods produced fell to 20-million dollars a year (Cslib.org 1c).

A good example of the effect of the Depression is seen in Yale and Towne Manufacturing Company, which manufactured Yale locks. In 1892, Yale and Towne employed approximately 100 people, nearly 6 percent of the population of Stamford. By 1916, that number had risen to 6,500. Roughly, one out of every eight people employed in Stamford worked for Yale and Towne. By 1937, Yale and Towne was losing money and began transferring jobs out of Stamford. Later that year they moved their corporate headquarters from Stamford to New York City (Cslib.org 1b).

New businesses did open during this period and existing businesses expanded, but new jobs could hardly keep the pace with the increasing unemployment. By the mid-1930s, 17 percent of Stamford was receiving municipal funds, the equivalent of welfare. This economic downturn was ended by the production increase as a result of the World War II, and the booming years that followed.

IV. MAIN STREET DAM

The Main Street Dam is an Ambursen Dam, a flat-buttressed dam designed and patented by Nils F. Ambursen in 1903 (Figure 3). Ambursen's design uses an inclined, vertical slab on the upstream side of the dam, which allows the water load to stabilize the dam and requires minimal buttress thickness for every unit of dam length. The Ambursen designed dam was very poplar in the early part of the twentieth century. The end of the 1920s had constructed more than 200 Ambursen Dams constructed throughout the United States.

The Ambursen Construction Company of New York constructed the Main Street Dam in 1922 during the heyday of Ambursen Dam construction. In addition to the Main Street Dam, there are four other Ambursen Dams in existence in the state of Connecticut: one in New London, two in Sprague, and one in Shelton (Eugene Robida, personal communication 2002).

The Main Street Dam, also known as the Mill Pond Dam, is approximately 67.5 feet in length and 7-feet high. There is a 4-foot steel intake gate near the western end of the dam. Letters on file at the State of Connecticut Department of Environmental protection, Dam Safety Section of the Inland Water Resources Division indicate that the bridge has been in need of repairs since 1988. In addition to the loss of a 1-foot section of the crest of the dam near the left abutment, the significant deterioration of the gate was noted, as well as a larger vertical crack adjacent to the gate. It is unknown whether repairs were made at that time or not. Currently the dam is visibly in need of repairs (Figure 4–5).

The site of the current dam is also the approximate location a dam constructed for the first gristmill in Stamford, built in 1641. The first mill and dam were destroyed the following year and replaced by another (Sherwood 1930). A second mill was built in the immediate vicinity in 1727, and by 1789 there were three mills near the dam at Main Street (Stamford Bicentennial Commission 1976). The Main Street Dam location has been the site for mill operations for more than 150 years; the last mill was standing well into the end of the nineteenth century (Sherwood 1930).

ARCHAEOLOGICAL SITES

According to records at the Connecticut Office of State Archaeology, there are no previously recorded archaeological sites in the vicinity of the Main Street Dam and associated portions of the project area. However, there could be archaeological sites, as yet unrecorded, in the impact areas for the proposed project. Such sites might include those derived from prehistoric or historic-period Native American use of the area, as settlement typically focused on perennial streams like the Mill River. There also may be historic Euroamerican sites in the proposed impact areas, particularly sites related to the series of mills located in this vicinity in the seventeenth through nineteenth centuries.

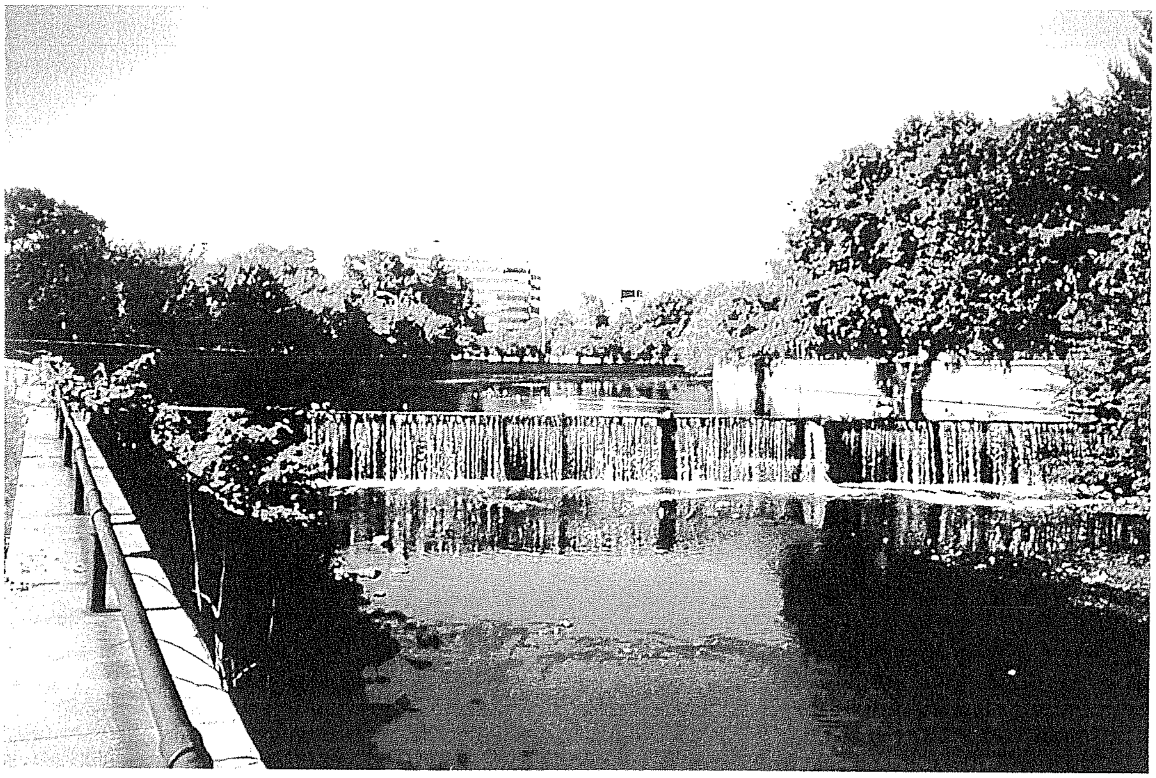

Figure 3. Mill River Dam, facing north.

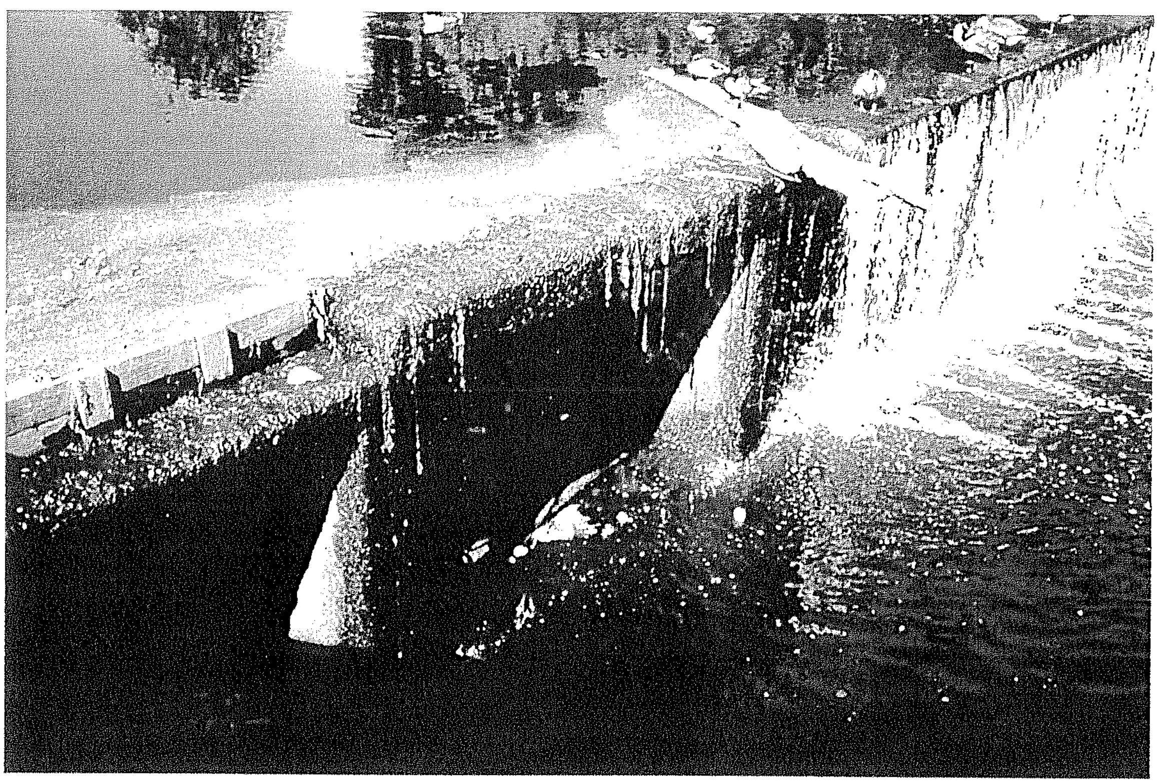

Figure 4. Close up of the crest and buttressing on the west side of the dam.

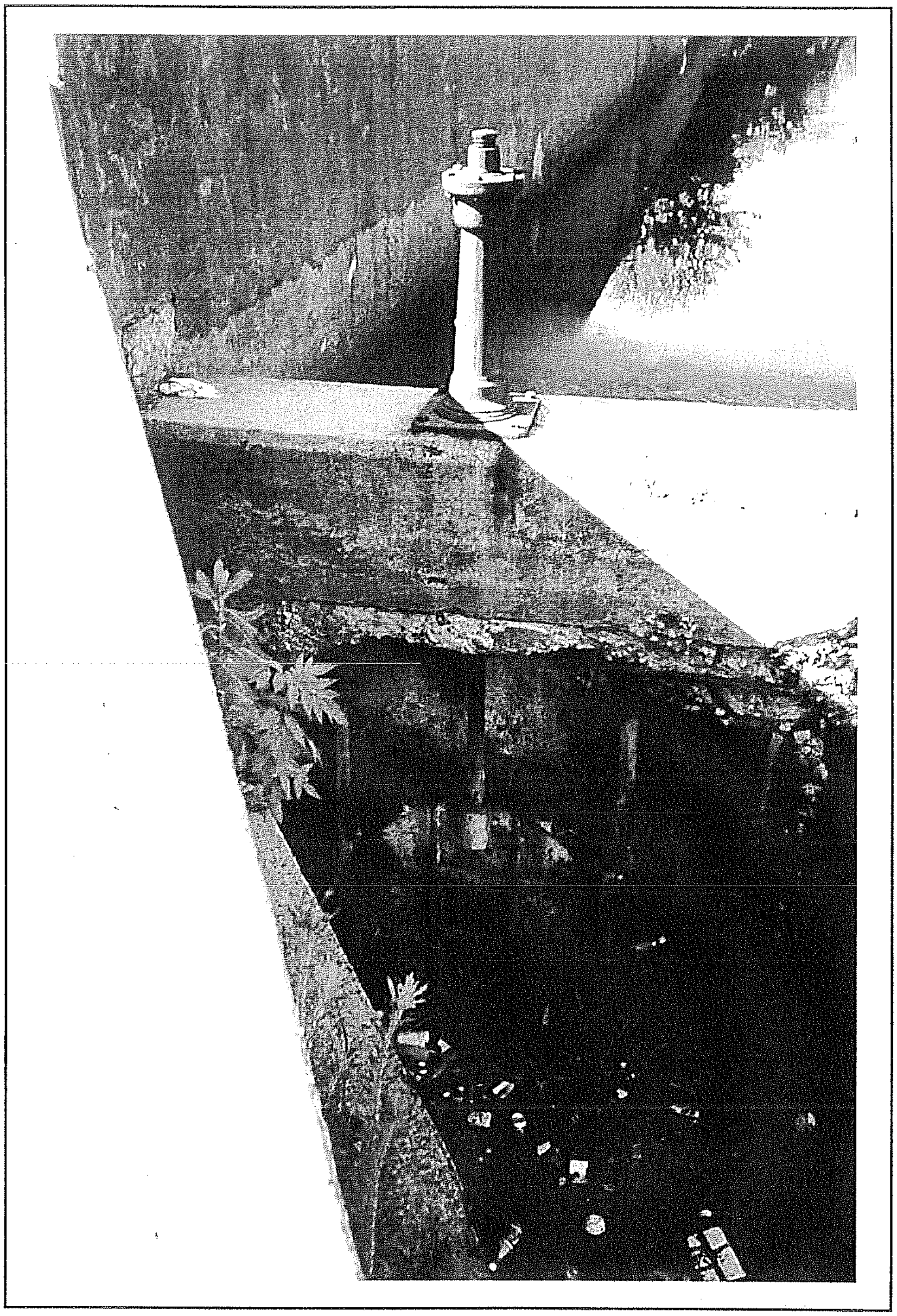

Figure 5. Steel intake gate on the west end of the dam.

Because of the potential for prehistoric and historic archaeological sites (especially mill sites) in the vicinity of the project area, we recommend that an archaeological survey be conducted once the precise project alternative has been determined. For example, under Alternatives 2 and 3 the Additional Restoration Actions will impact areas that have a high probability for archaeological resources.

NATIONAL REGISTER OF HISTORIC PLACES PROPERTIES

There are seven properties within a 1-mile radius of the project area listed on the National Register of Historic Places, including the Main Street Bridge and two historic districts—the Downtown Stamford Historic District and the Downtown Stamford Ecclesiastical Complexes. The individually listed properties are in Table 1, and the properties listed in the Downtown Stamford Ecclesiastical Complexes are in Table 2. The Downtown Stamford Historic District is bounded by the Atlantic, Main, Bank, Bedford, Summer between Broad and Main streets, and Summer Place. None of the properties listed will be adversely impacted by the proposed project.

Table 1. Buildings within a 1-Mile Radius of the Project Area.

Address	Historic Name	Year Listed
713 Bedford Street	Benjamin Hait House	1969
10-12 Linden Place	Linden Apartments	1983
Main Street over the Rippowam River	Main Street Bridge	1987
Junction of Atlantic, Bank and Main Streets	Old Town Hall	1972
164 Fairfield Ave	Gustavus and Sarah T. Pike House	1990
580 Main Street	Suburban Club	1989
421 Atlantic Street	U.S. Post Office-Stamford Main	1987

Table 2. Downtown Stamford Ecclesiastical Complexes.

Address	Historic Name	Year Listed
305 Washington Blvd.	Church of the Holy Name	1987
1231 Washington Blvd.	St. Andrews Protestant Episcopal Church	1983
1A St. Benedict's Circle	St. Benedict's Church	1987
628 Main Street	St. John's Protestant Episcopal Church	1987
714 Pacific St.	St. Luke's Chapel	1987
540 Elm Street	St. Mary's Church	1987
20 Forest St.	Unitarian-Universalist Church	1987
132 Glenbrook Rd	Zion Lutheran Church	1987

V. SUMMARY AND CONCLUSION

The Main Street Dam does not embody a unique type or method of construction; it is not an unique structure within the State of Connecticut and is therefore not eligible for the National Register of Historic Places. Removal of the Main Street Dam will have no adverse impact to properties currently listed on the National Register of Historic Places.

Because of the potential for prehistoric and historic archaeological sites (especially mill sites) in the vicinity of the project area, TRC recommends that an archaeological survey be conducted once the precise project alternative has been determined. Any locations where ground-disturbing activities will be carried out will require systematic archaeological survey coverage.

REFERENCES

Bernabo, J. Christopher, and Thompson Webb III
1977 Changing Patterns in the Holocene Pollen Record of Northeastern North America: A Mapped Summary. *Quaternary Research* 8:64–96.

Braun, E. Lucy
1950 *Deciduous Forests of Eastern North America.* The Blakistan Company, Philadelphia.

Coe, Joffre L.
1964 *The Formative Cultures of the Carolina Piedmont.* Transactions of the American Philosophical Association 54(5).

Cslib.org
1a (n.d.)*A Condensed History of Connecticut-1.* Retrieved August 21, 2002, from http://www.cslib.org/stamford/h_beg.htm

1b (n.d.)*A Condensed History of Connecticut-2.* Retrieved August 21, 2002, from http://www.cslib.org/stamford/h_19th.htm

1c (n.d.)*A Condensed History of Connecticut-4.* Retrieved August 21, 2002, from http://www.cslib.org/stamford/h_20th.htm

1d (n.d.)*A Condensed History of Connecticut-5.* Retrieved August 21, 2002, from http://www.cslib.org/stamford/h_excite.htm

Curran, Mary Lou
1999 Exploration, Colonization, and Settling In: The Bull Brook Phase, Antecedents, and Descendants. In *The Archaeological Northeast,* edited by Mary Ann Levine. Ken Sassaman, and Michael S. Nassaney, pp. 3–24. Bergin and Garvey, Westport.

Davis, Margaret B.
1983 Holocene Vegetational History of the Eastern United States. In *Late Quaternary Environments of the United States, Volume 2, The Holocene,* edited by H.E. Wright, pp. 169–180. University of Minnesota Press, Minneapolis.

Davis, Margaret B., Ray W. Spear, and Linda C. K. Shane
1980 Holocene Climate of New England. *Quaternary Research* 14:240–250.

Dincauze, Dena F.
1971 An Archaic Sequence for Southern New England. *American Antiquity* 36(2):194–198.

1974 An Introduction to Archaeology in the Greater Boston Area. Archaeology of Eastern North America 2:39–67.

1975 The Late Archaic Period in Southern New England. *Arctic Anthropology* 12(2):23–24.

1976 *The Neville Site: 8,000 Years at Amoskeag.* Peabody Museum Monographs 4. Harvard University, Cambridge.

Dincauze, Dena F., and J. Mulholland
1977 Early and Middle Archaic Site Distributions and Habitats in Southern New England. In *Amerinds and Their Paleoenvironments in Northeastern North America.* Annals of the New York Academy of Sciences, vol. 288.

E. Robida Civil Engineer for the Dam Safety Section of the Inland Water resources division of the State of Connecticut Department of Environmental Protection
2002 Personal Communication

Feinstein, Estelle F.
1999 *Stamford Connecticut, 1641-1893: the First Two-and-a-half centuries.* Transcript of speech delivered at the Ferguson Library. Retrieved August 21, 2002, from http://www.stamfordhistory.org/feinhist.htm

Fenneman, Nevin M.
1938 *Physiography of the Eastern United States.* McGraw-Hill Book Company, New York.

Fitting, J. E.
1968 Environmental Potential and the Post Glacial Readaptation in Eastern North America. *American Antiquity* 33(4):441–445.

Hoffman, Curtiss, R.
1985 Revising the Late Archaic Period in Southern New England. *Archaeology of Eastern North America* 13:58–78.

Ilgen, Lewis W.
1966 *Soil Survey of Tolland County, Connecticut.* U.S. Department of Agriculture, Soil Conservation Service in cooperation with the Connecticut Agricultural Experiment Station and the Storrs Agricultural Experiment Station.

Isachsen, Y. W., Donald W. Fisher, J. M. Lauber, L. V. Richard, and W. B. Rogers (editors)
1991 *Geology of New York.* Educational Leaflet No. 28. New York State Museum Geological Survey, The State Educational Department, University of the State of New York, Albany.

Juli, Harold D., and Kevin A. McBride
1984 The Early and Middle Woodland Periods of Connecticut Prehistory: Focus on the Lower Connecticut River Valley. *Bulletin of the Archaeological Society of Connecticut* 47:89–98.

Lavin, Lucianne

1984 Connecticut Prehistory: A Synthesis of Current Archaeological Investigations. *Bulletin of the Archaeological Society of Connecticut* 47:5–40.

1988a The Morgan Site, Rochy Hill, Connecticut: A Late Woodland Farming Community in the Lower Connecticut River Valley. *Bulletin of the Archaeological Society of Connecticut* 51:7–21.

1988b Coastal Adaptation in Southern New England and Southern New York. *Archaeology of Eastern North America* 16:101–120.

McBride, Kevin A.

1984a Middle and Late Archaic Periods in the Connecticut River Valley: A Re-Examination. *Bulletin of the Archaeological Society of Connecticut* 47:55–72.

1984b *Prehistory of the Lower Connecticut River Valley.* Unpublished Ph.D. dissertation, University of Connecticut, Department of Anthropology. University Microfilms International, Ann Arbor.

McBride, Kevin A., and Nicholas Bellantoni

1982 The Utility of Ethnohistoric Models for Understanding Late Woodland-Contact Period Culture Change in Southern New England. *Bulletin of the Archaeological Society of Connecticut.*

McBride, Kevin A., and R. Dewar

1981 Prehistoric Settlement in the Lower Connecticut River Valley. *Man in the Northeast* 22:37–66.

1987 Agriculture and Cultural Evolution: Causes and Effects in the Lower Connecticut River Valley. In *Emergent Horticulture Economies of the Eastern Woodlands,* edited by William F. Keegan, pp. 305–328. Occasional Paper No. 7. Center for Archaeological Investigations, Southern Illinois University.

McNutt, Charles H. (editor)

1996 *Prehistory of the Central Mississippi Valley.* University of Alabama Press, Tuscaloosa.

Moeller, Roger

1984 The Ivory Pond Mastodon Project. *North American Archaeologist* 5(1):1–12.

Mulholland, Mitchell T.

1988 Territoriality and Horticulture: A Perspective for Prehistoric Southern New England. In *Holocene Human Ecology of Eastern North America,* edited by George Nicholas, pp. 137–166. Plenum Press, New York.

Nicholas, George P.
1988 Ecological Leveling: The Archaeology and Environmental Dynamics of Early Post-Glacial Land Use. In *Holocene Human Ecology in Northeastern North America,* edited by G. Nicholas, pp. 257–296. Plenum Press, New York.

Pfeiffer, John E.
1984 The Late and Terminal Archaic Period in Connecticut. *Bulletin of the Archaeological Society of Connecticut* 47:73–88.

1990 The Late Terminal Archaic Periods of Connecticut: A Model of Continuity *Bulletin of the Archaeological Society of Connecticut.*

Poirier, David A.
1987 *Environmental Review Primer For Connecticut's Archaeological Resources.* Connecticut Historical Commission. State Historic Preservation Office. Hartford, Connecticut.

Ritchie, William A.
1969 *The Archaeology of Martha's Vineyard.* Natural History Press, Garden City, New York.

1980 *The Archaeology of New York State* (revised edition). Harbor Hill Books, New York.

Ritchie, William A., and Robert E. Funk
1971 Evidence for Early Archaic Occupations on Staten Island. *Pennsylvania Archaeologist* 41(3):45–59.

Rodgers, John
1985 Bedrock Geologic Map of Connecticut. Connecticut Geological and Natural History Survey, Department of Environmental Protection in cooperation with the U.S. Geological Survey, Department of the Interior.

Sherwood, Herbert F.
1930 *The Story of Stamford.* The States History Company, New York.

Snow, Dean R.
1980 *Archaeology of New England.* Academic Press, New York.

Stamford Bicentennial Commission
1976 *Stamford Past & Present 1641–1976.* Stamford Bicentennial Commission, Stamford.

Turnbaugh, William A.
1975 Toward an Explanation of the Broad-Point Dispersal in North American Prehistory. *Journal of Anthropological Research* 31.

Wolf, Barrie L.
1981 *Soil Survey of Fairfield County, Connecticut.* U.S. Department of Agriculture, Soil Conservation Service in cooperation with the Connecticut Agricultural Experiment Station and the Storrs Agricultural Experiment Station.