

The Aberjona River: Shoreline Survey Results, Analysis, and Action Plan



View of the Aberjona River

Prepared by volunteers of the Mystic River Watershed Association
Surveyed, Fall 2001

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EXECUTIVE SUMMARY

The Aberjona River is an approximately nine mile-long river that forms the headwaters of the Mystic River watershed northwest of Boston, Massachusetts. It begins in a residential area of Reading, flows through commercial and industrial areas of east Woburn, passes through the center of Winchester, and empties into the Upper Mystic Lake.

In the fall of 2001, approximately 35 community volunteers conducted a shoreline survey of the Aberjona River. A shoreline survey is a visual survey of both the shoreline and in-stream conditions of a river. This assessment enhances the local community's awareness of the river's assets and problems. The goal is to mobilize the community to protect and restore the river's health.

The Aberjona River Shoreline Survey volunteers were trained and divided into 18 teams. Surveyors observed characteristics of the river and its immediate shoreline and documented their findings. This report compiles their data and provides summaries of the information, organized by town. An action plan to address problems identified by the survey is proposed in the final section.

Survey data show effects of development and human activity along the length of the Aberjona:

- Trash has collected in vegetation, and there is evidence of dumping.
- Run-off from lawns and yards was noted both in residential areas and from parking lots in commercial areas.
- Channels were noted where the river has been artificially diverted from its natural course, and in some commercial areas, the natural wetlands that once lined the river have been largely replaced with pavement.
- Numerous stormdrains and pipes discharge to the river. In several instances, pipes show evidence of discharging scum or foul-smelling liquid.
- Over-growth of non-native plants such as Phragmites, Purple Loosestrife, Japanese Knotweed, and Oriental Bittersweet were found throughout the study area.
- River obstructions were common and banks were eroded.

The picture is not all bad, however. Survey data also show the Aberjona River to be a viable natural resource and an asset to each community through which it flows.

- The river has a number of conservation areas, wetlands and parks along its banks.
- It supports a remarkable diversity of wildlife and vegetation.
- Visible water quality is generally good (i.e. water is clear and, for the most part, odorless.)
- There are both formal and informal access points to the river, with potential to develop more. Each community has at least one access point.

Although the Aberjona River suffers the effects of development and human activity all along its length, it is a resource worth restoring and protecting. This group recommends restoring the river by addressing problems identified in the survey and encouraging coordinated stewardship of the river in all three towns:

- Provide findings to government and community groups.
- Organize a local *Friends of the Aberjona River* group to advocate for restoring the river's health.
- Support efforts to develop and maintain greenways along the river.
- Organize regular river patrols and trash clean up days.

Introduction

Flowing through Reading, Woburn, and Winchester, the Aberjona River empties into the Upper Mystic Lake, the Mystic River, and ultimately Boston Harbor. The river has played an important historical role in the development of these towns, as well as to the region's ecology.

Unfortunately, human activity has long taken a toll on the river's health. In 2000, the Mystic River Watershed Association (MyRWA) began an effort to evaluate the condition of the Aberjona shoreline and to identify actions needed to restore and protect it. This project employed a protocol developed by the Massachusetts Riverways *Adopt-A-Stream Program* to initiate a visual survey of the river. Adopt-A-Stream works with citizens to support and develop projects in watersheds across the state that restore habitat and natural stream structure, protect flow and identify and prevent non-point source pollution. Adopt-A-Stream provides a suite of monitoring and restoration tools that help citizens become active stewards of their watersheds. This report is the result of MyRWA's participation in that program and serves as a first step in efforts to restore the river and its shoreline.

Shoreline Survey Goals and Methods

A Shoreline Survey is a visual survey of a local river or stream. The survey provides a one-time "snapshot" of the river's current conditions, and identifies problems that need to be addressed and resources that would benefit from protection. Volunteers, typically including residents, business people, municipal officials, students, and anyone interested in protecting or restoring a particular river or brook within the watershed, form a 'Stream Team' to conduct the survey. Following training sessions conducted by *Adopt-A-Stream* staff, teams of surveyors visit a stretch of shoreline to observe and record both shoreline and in-stream conditions. The Stream Team then compiles the data, develops an action plan, publicizes its plan to the greater community, and works to implement its recommendations. These recommendations include short-term and long-term actions for restoring the river's health, and may include halting illegal discharges or dumping, sponsoring clean-ups, advocating for open space protection, and raising awareness of the river's assets.

Aberjona River Shoreline Survey

Volunteers gathered on several days during October and November, 2001, to survey stretches of the Aberjona River. This survey was conducted during a period of prolonged drought. Volunteers were divided into teams of 2 or 3 and each team was assigned a different stretch of the river. The river was divided into 23 segments, although only 18 were surveyed. (The number of volunteers and time required for each segment prevented surveys being completed for three segments in Reading and two segments in Woburn). The information reported by the volunteers was compiled by MyRWA staff and volunteers and was used to generate this report. Summaries for each segment are available in the appendix.

The Aberjona Shoreline Survey was supported by the following local groups:

Friends of the Upper Mystic Lake

Woburn Residents' Environmental Network (WREN) www.GoWREN.org

Mystic River Watershed Association (MyRWA) www.mysticriver.org

More information about each group is located in Appendix 3.7.

Historical Context

The Aberjona River forms the headwaters of the Mystic River watershed. Formed as a result of glacial activity nearly 10,000 years ago, the Aberjona River originally consisted of a vast wetland system of ponds and small lakes connected by streams and brooks and flowing into Mystic Pond (now the Upper and Lower Mystic Lakes). However, human activity has had a significant effect on the river over the years.

Prior to the European colonization, human inhabitants had probably lived in the area for thousands of years. The two groups most closely associated with the Aberjona River valley area were the Massachusetts and the Pawtucket tribes.

Europeans arrived in the region in the early 1600's. After 1631, Captain Edward Johnson, considered the founder of Woburn, conducted a detailed exploration of the area. He and other citizens of Charlestown were granted lands in an area first called Waterfield, just north of Mystic Lake. This name is a testament to the wetland origins of much of the river. The river's name, Aberjona, appears in colonial records from the beginning, but the name's origins are not known with certainty. There is no other river in the United States with the same name.

The first permanent home of a European along the river was that of Edward Converse, built around 1640. The first permanent bridge over the Aberjona was completed in February of 1641, at what is now the "Converse" Bridge in Winchester Center.

Thus began the history of human influence on the Aberjona River that has brought about much change. Millraces were the first constructions that began to affect the river. In the 17th and 18th centuries, the valley was dominated by agriculture. Industry was modest and merely a support to agriculture.

Early in the 19th century, the industrial revolution began to affect Woburn, Winchester, and the Aberjona River itself. The Middlesex Canal opened in 1803 and the Boston and Lowell Railroad in 1835, the latter running adjacent to the river for most of its length. These two developments initiated the transformation of the area to an industrial-based economy. The river became a source of water for these manufacturing processes, as well as a means of disposing of industrial waste.

Tanneries in Woburn existed as early as 1666, and by 1865 there were 21 tanneries and currying shops in Woburn. By the latter part of the 1800s, industry was well established in Woburn and there were factories in Winchester as well. Pollution from tanneries in both towns was known to be affecting the river and the Upper Mystic Lake by the 1870s. (The Upper Mystic Lake had become a water supply for Charlestown and adjacent towns by that time). The Massachusetts Legislature banned the discharge of wastes into Horn Pond Brook (a tributary) in 1907 and into the Aberjona in 1911. During much of the 20th century, the state and federal government was actively addressing water quality of the river and its watershed.

The towns along the Aberjona were fully sewered and the tanneries' waste could be piped away by the 1930s. Sludge from the tanneries remained a major problem, however, and tanneries were

required to build lagoons to hold the waste until the solids could be separated out. Lagoon wastes were then placed into piles or buried in landfills.

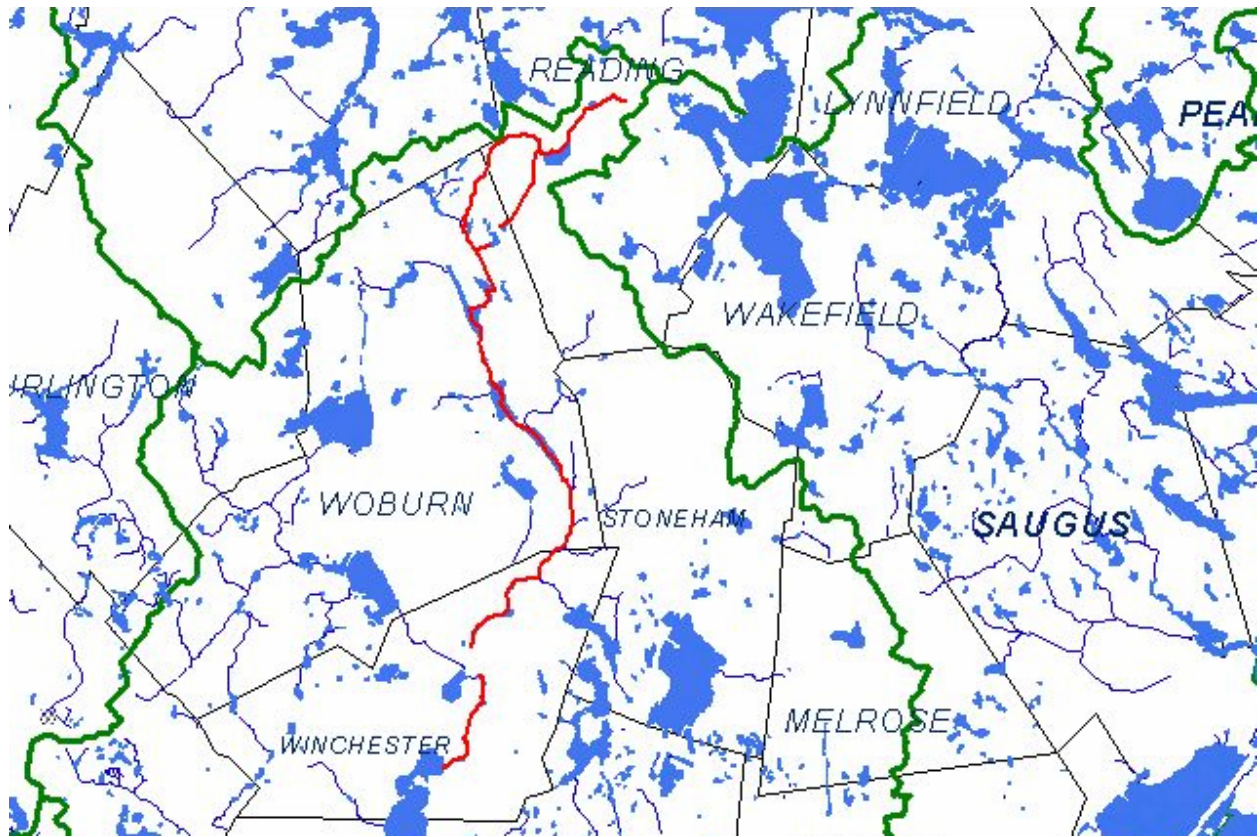
Development after World War II resulted in dramatic changes to the river itself. In Reading, the river's almost hidden course through the rural western portion of town began to attract housing developers. Residences and schools rapidly replaced farms.

Woburn industry continued to grow, especially in the vicinity of the Mishawum section of Woburn. Growth accelerated as modern transportation developed. In 1951, Route 128 spanned the Aberjona near Mishawum and in 1960, Interstate 93 was built on the eastern edge of the valley. I-93 crosses Route 128 (now I-95) close to where the latter crosses the Aberjona and then I-93 crosses the river itself just to the north, as the river emerges from Reading. This confluence of highways helped foster the development of the Industri-plex site. From 1969 into the early 1980s, Mishawum area was developed to become a modern industrial zone. Manufacturing plants at the Industri-plex site ultimately contributed to the extensive contamination of the area.

Construction along the Aberjona in the Mishawum area of Woburn included the channeling of the river along a narrow run down the center of Commerce Way and then, at a hard right turn, the river flowed adjacent to the Halls Brook Holding Area (HBHA), an artificial pond. Just south of I-95, the river runs through a wetland area that contains two public drinking water wells – Wells G & H. Wells G & H provided public water until 1979, when they were found to be contaminated and were closed. Both the Industri-plex and Wells G & H sites became Superfund sites in the 1980s, as a result of severe industrial pollution. Today Industri-plex has been substantially cleaned up, but continues to be a center for light industry, offices and retail stores, and their companion parking lots in this former wetland. Wells G & H remain closed. The US Environmental Protection Agency released a major study of the extent to which the two Superfund sites have contaminated the river; see appendix for link to report.

In Winchester, many of the changes along the river were associated with public initiatives. In the late 1950s, Mystic Valley Parkway and the development of the Manchester Field area resulted in diversion of the river into a channel beginning at Waterfield Street in Winchester Center. Another major change occurred during the construction of the current Winchester High School in the 1960s. The school was placed in an area that was covered by ponds formed by the river. The river was forced into a culvert just south of Swanton Street and then disappears under the school's athletic fields. Other areas along the river were developed as park and recreational areas, although by the 1990s some of those areas had fallen into disuse. The mouth of the river empties into the Upper Mystic Lake, which by the 1950s was, and still is, under the control of the Metropolitan District Commission (now Department of Conservation and Recreation) as parkway and parkland.

Aberjona River Map



Red line= Aberjona River
Green line = Mystic River Watershed Boundary

Results and Analysis

1.1 Aberjona River, Reading Segment

1.1.1 Survey Area

The Aberjona River begins in a quiet, residential neighborhood of Reading, in a narrow channel along the sidewalk between the Coolidge Middle School and the Reading Memorial High School. Almost immediately, the river disappears under the High School playing field, before it resurfaces again a few hundred feet downstream. The next section passes through three small conservation areas (Higgins Property, Criterion Road, and Pitman Parcel), and the first of three active beaver dams. The river is then culverted under Route 129 and immediately passes through the Maillet, Sommes and Morgan Land areas, and a second beaver dam. At this point, it has traveled about one mile of its approximate two-mile length in Reading. Access is limited in this area due to the wetlands and dense vegetation. Shortly after it passes under the commuter train tracks, the river splits into a north and south branch. The north branch flows through the Austin Preparatory School's property, and three small conservation areas (Sheehan, Xavier, and the Boyd Lot), as it enters Woburn, before passing under Interstate 93. Here, the river flows through the Inwood Office Park, which is located on the east side of I-93, on the Reading/Woburn line. The south branch of the Aberjona flows through the Thelin Bird Sanctuary, the backyards of a residential neighborhood along Arcadia Avenue, a small wooded area off of Arnold Street, and the third beaver dam. It then enters Woburn just before it passes under I-93.

1.1.2 Survey Findings

The Aberjona River in Reading is most notable for its wooded surroundings. In the approximately two miles that it flows through the town of Reading, it passes through 8 small parcels of conservation land, as well as past three schools, residential neighborhoods and one office park. The river is generally fairly narrow and shallow through much of its course. However, there were sections of the river where stronger flow was noted. Public access to the river was generally good, except in areas where wetlands were flooded or where brush was too dense to allow for easy passage. This is of course less true in some of the privately owned sections, such as the Austin Preparatory School, the South Branch near the Thelin Bird Sanctuary and along Arcadia St. The most notable human impacts were felt to be the burying of the river under playing fields, evidence of yard waste and garbage, and the introduction of several species of non-native vegetation, specifically Japanese Knotweed, Phragmites, Purple Loosestrife, Common Buckthorn, and Oriental Bittersweet. Many wetland areas were also noted, and some areas seem prone to flooding. The primary animal impacts were the three active beaver dams, with signs of chewed stumps. Surveyors also recorded signs of birds, such as feathers, nests, and birdsong, and observed woodpeckers, chickadees, blue jays, goldfinches, mockingbirds and sparrows. Some animal tracks were noted.

a. Water Quality

Generally, the water appeared clear. There was, however, one area near the Reading Memorial High School at the headwaters of the river, where an orange scum was observed both during the

survey and about a month later. There were some brown algae noted, as well as a patch of foam and waxy film, near the Castine Soccer Field. In another section, near West St., an oily sheen was noted. One tributary near West St. had a foul smell associated with it. As indicated above, the water was generally fairly shallow, and flow was sluggish through much of its length. Many surveyors noted brush, broken limbs or fallen trees blocking the channel. Rocks and boulders were also noted in the river. Pipes were noted but no flows were observed. Surveyors noted that there were no visible barriers to salt or sand runoff in the areas near I-93, both along the north and south branches, as well as along West St. and Route 129. A large accumulation of sand was noted near West St.

b. Bank Conditions

Due to the prevalence of conservation areas in the Reading segment of the river, most of the river's shorelines were forested and riverbanks were shaded. Some diversity of trees, shrubs and wildflowers was noted, particularly red maples, birches, aspens, red oaks, pines, alders, fruit trees, sumacs, ferns, tansy, goldenrods and blackberries. Banks were overgrown in some areas. Erosion was observed along many stretches of shoreline, resulting in both exposed tree roots and disturbed banks. Wetlands were observed in many areas, though they were often dominated by thick stands of invasive species, primarily Purple Loosestrife (*Lythrum salicaria*) or Phragmites (*Phragmites australis*). In one area, about a half mile north of I-93, a large stand of Purple Loosestrife overwhelmed a stand of cattails. Just downstream from this section, there was a large wetland area completely dominated by Phragmites. Slightly downstream, and just before the third beaver dam, the flow was stronger, and the channel widened. Phragmites were also dominant in this section.

c. Access to the River

As stated earlier, access is generally good throughout the surveyed Reading sections of the river. Land uses are primarily open space and residential, with some trails found along the river. Several tributaries were noted, particularly in the Xavier Conservation land. This area is characterized by woods and good public access. One culvert under Route 129 was blocked. In addition, fencing blocked access to the riverbank near Route 129. The section near the Inwood Office Park was wooded with old stone walls and fruit trees.

1.1.3 Discussion and Interpretation

The Reading section of the Aberjona River includes many attractive assets. Many of its sections are forested, with some trail access. Much of the river's length is quiet and peaceful with the exception of some highway noise as the river approaches the interstate highway. Surveyors noted both typical native and non-native species along the shoreline. However, it is a river that would benefit by some additional care and attention. Wetlands, though still an integral part of the Reading section, were overgrown with aggressive, non-native species. River obstructions were common, banks were eroded, and there were frequent signs of runoff from lawns. In addition, several surveyors noticed signs of dumping (barrels and vehicle tracks were observed), as well as considerable trash that had collected in vegetation.

There were no visible signs anywhere along the river that identified it as the Aberjona River. In fact, some local residents mistakenly stated that the Aberjona did not flow behind their

properties. This was perhaps due to the stream like nature of the river, or to the town's strong association with the Ipswich River.

1.1.4 Priorities for the Reading Segment

- Survey remaining segments of the Reading section of the Aberjona River.
- Meet with local open space committee to discuss opportunities for raising the visibility of the Aberjona River in Reading. Organize outreach program to Reading residents that live in the Mystic watershed to focus attention on the Aberjona. For example, conduct outreach to Arcadia Avenue residents, whose homes abut the river.
- Target an outreach program to students, specifically at the Coolidge Middle School, Reading Memorial High School, and Austin Preparatory School, to help raise awareness of the river and promote a field study component.
- Contact local scout troops to promote interest in using the Aberjona as an opportunity for cleanups and trail maintenance.
- Prepare a map depicting trails and access points for public distribution.
- Evaluate orange scum found at headwaters.
- Empty / clean / maintain stormdrains and culverts (particularly under Route 129).
- Contact Mass Highway to discuss plans to keep road salt, plowed snow and highway runoff (from I-93 and Route 129) from entering the river.
- Talk with the Woburn Conservation Commission about future access at the Inwood Office Park, on the Woburn / Reading line.
- Remove invasive plants; organize plantings of native species; stabilize banks; obtain funding for a limited wetlands restoration project.
- Promote ongoing protection of Reading's open spaces.

1.2 Aberjona River, Woburn Segment

1.2.1 Survey Area

The Aberjona River enters Woburn from Reading as two separate branches. The north branch flows along I-93 by the Inwood Office Park. This branch then heads towards the intersection of Atlantic Ave. and Commerce Way. The north branch runs through a ditch through the middle of Commerce Way. The south branch flows by Phillips Pond before joining the north branch just south of the Target store (101 Commerce Way). This stretch of the river between Atlantic Avenue and the Target store is part of the Industri-plex superfund site. The river continues to follow Commerce Way toward Cabot Road and then takes an unnaturally sharp turn just before the Halls Brook Holding Area Pond (HBHAP). The river continues on a parallel course to the HBHAP, but is kept separate from the HBHAP by a manmade berm. The HBHA ends in a dam and below the spillway the water joins the Aberjona. The Aberjona then flows under Mishawum Road and Route 128 and alongside Normac Road. After crossing under Olympia Avenue, the river enters the Wells G & H Superfund site. The river then runs under Salem Street, enters the cranberry bogs at Burbank Pond, crosses Montvale Avenue, and runs parallel to Washington Street as it enters Winchester.

1.2.2 Survey Findings

The Aberjona River is heavily impacted by human activity as it passes through Woburn. This activity has seriously damaged the river, leaving its banks littered with trash, its water visibly contaminated, and even its shape obviously modified. The river still suffers the effects of the tanneries that once lined its banks. The Industri-plex site, a 245-acre industrial park in the northeastern corner of Woburn, was once used for manufacturing a variety of chemicals, including lead-arsenic insecticides, acetic acid, and sulfuric acid, which were then used by the local paper, textile and leather industries. The manufacturing of glue, from raw animal hides and chrome-tanned hide wastes, also took place at this site. These activities have left the soil and groundwater contaminated with volatile organic compounds (VOCs), including benzene and toluene, and heavy metals, including arsenic, chromium, and lead. The activities that took place near the Wells G & H site, downstream, had similar effects. The Wells G & H site is also contaminated with heavy metals, such as chromium, zinc, mercury and arsenic, as well as with polycyclic aromatic hydrocarbons (PAHs). US EPA Region 1 recently conducted a long-term study of the sediments, soil and wetlands of the Aberjona to determine what threat they might pose to plants and animals living in and around the river. The EPA published their results of this study in a *Human Health Risk Assessment* and an *Ecological Risk Assessment*, (Spring and Summer, 2003). Additionally, the Massachusetts Department of Health and Agency for Toxic Substances and Disease Registry published a public health assessment in 1995 (see Information Resources for website).

Present day commercialization and development, such as that along Mishawum Road and Commerce Street, are also having significant impacts on the river. The banks of the Aberjona in this area are clearly suffering the effects of erosion. Parking lot runoff and discharge from pipes have further contributed to the contamination of the water. Despite these abuses, the river still maintains some of its natural beauty, as evidenced by the Burbank Pond area. The river also continues to support wildlife and vegetation. Unfortunately, in many areas the natural vegetation is being overtaken by non-native species including, Phragmites, Japanese Knotweed, Purple Loosestrife, Common Buckthorn, and Oriental Bittersweet.

a. Water Quality

The flow of the river varies from quick to almost still in some areas. These still areas are generally due to logjams or trash and debris that restrict the flow of the water. The river is generally one foot wide or less, but reaches twenty feet in some areas. The depth ranges from one to five feet. The river bottom is predominantly sand, with some silt and cobbles.

In general, the water appeared clear and odorless, however discolored, odorous substances were seen flowing into the river from various pipes and tributaries. Visible water quality issues were specifically noted in a few areas including: near Commerce Way; behind Spud's Restaurant, where the water is milky white; at the intersection of MetroNorth Drive and Atlantic Avenue, where the river is being heavily impacted by construction; and on Olympia Avenue, where the runoff from a truck/bus parking lot was causing an oily sheen on the water. There was often an oily sheen and a significant increase in the amount of trash where the river runs near or under roads and parking lots.

More than a dozen pipes were noted along the river, many actively flowing on dry days. The pipes that were of greatest concern are the following:

- At the Terradyne office (near 38 Cabot Road) a pipe was seen discharging whitish-opaque, foul-smelling liquid.
- Along Commerce Way, a pipe was observed discharging tan/orange/yellow substance that was clinging to the rocks and the river bottom.
- Near the Fairfield Inn (285 Mishawum Rd), one pipe was discharging orange scum and another discharged a liquid smelling of rotten eggs.

What appeared to be sewage pipes crossed over the river, connecting the 99 Restaurant and the Fairfield Inn. Although they did not appear to be leaking at the time of the survey, they should be monitored for possible dry weather flows. There were also two unidentifiable cement structures behind Rainin Company that should be further investigated.

There was evidence of wildlife, including birds, rabbits, deer, raccoons and rodents, along the less impacted stretches of the river. Some aquatic insects were observed, but otherwise there was no evidence of aquatic life. Aquatic vegetation was noted, including algae and duckweed.

b. Bank Conditions

The river was generally shaded by shoreline vegetation. This vegetation included cattails, pines, maples and oak trees, as well as invasive species like Phragmites, Japanese Knotweed, and Oriental Bittersweet. The banks of the Aberjona are eroded and heavily impacted by human activity. In the more industrialized and commercialized areas, parking lots often extend right to the river's edge. The worst example of this was seen on Olympia Avenue. The effect of runoff from these parking lots was evident, as an oily sheen was reported in several areas. The sand used on roads and parking lots in the winter had also impacted the river. In one section below the HBHA, the amount of sand entering the river was so great that sand bars had actually formed downstream. The banks were littered with trash, including computers, shopping carts, plastic tarps and general debris. Trash was of particular concern behind the Howard Johnson's on Montvale Avenue and at a midnight dumping site off Cabot Road.

c. Access to the River

The greatest public access to the Aberjona in Woburn is found at the Burbank Pond cranberry bog area, where hiking trails and picnic areas are available for public use. An unofficial trail was also found off of Cabot Road, leading to an area south of the HBHA. Public access in some areas, including the scenic area near the HBHA, could be enhanced with the addition of hiking trails, picnic benches and signs identifying the river.

1.2.3 Discussion and Interpretation

There is very little public access to the river in Woburn, with the exception of the Burbank Pond area. In fact, through some of its length, the Aberjona flows through a ditch with no indication that it is the Aberjona. The commercial development of surrounding land, coupled with this general lack of awareness, has left the river neglected and abused.

Human activity has clearly taken a toll on the health of the river, as evidenced by the effluent flowing from pipes, sand and salt discharges, and the trash along the river's banks. The natural

wetlands that once lined the river have been largely replaced with pavement or overcome by invasive species.

1.2.4 Priorities for the Woburn Segment

- Identify owners of scenic areas and work together to increase public access to and awareness of the river (i.e. cranberry bog area).
- Monitor water quality behind Spud's Restaurant, at the intersection of MetroNorth Drive and Atlantic Avenue, and monitor on Olympia Avenue.
- Alert the Woburn Conservation Commission and Public Health officer about the pipes near the Terradyne Office, along Commerce Way and behind the Fairfield Inn.
- Organize a clean-up of the trash at the HBHA, behind Howard Johnson's, and on Cabot Way.
- Continue to monitor sewage pipes next to the 99 Restaurant.
- Notify the Woburn Conservation Commission of the oil that can be seen on the river's bank coming from the parking area near Olympic Ave.
- Approach the Fairfield Inn and other property owners about the trash overflow on their properties.

1.3 Aberjona River, Winchester Segment

1.3.1 Survey Area

The Aberjona River exits Woburn south of Montvale Avenue and flows along a shallow depression west of I-93 and bordered by Washington Street on the west. The river then passes through a culvert under Washington Street, flows through Davidson Park, and falls over a small dam and under Cross Street.

The Aberjona continues past Leonard Pond. Here the river passes through an area largely removed from public view. First it flows behind the Muraco School playing fields, then under the railroad, past the Winchester Transfer Station, and through a wooded area adjacent to The Village condominiums. After passing under Swanton Street, the river enters a culvert that routes it under the Winchester High School athletic fields.

Emerging from the culvert at Skillings Road, the Aberjona flows past the Super Stop & Shop property, where it is joined by Horn Pond Brook. It flows east under the railroad and into Judkins Pond. The river becomes a prominent feature of the town's center at Judkins Pond. The river empties out of the pond, flows between the Jenks Senior Citizen Center and the Arthur Griffin Museum, and shortly thereafter passes under Mt. Vernon Street. There the river widens into the Mill Pond, with the Library lawn on the east, Lincoln School on the hill to the south, and the commercial district of the center on the northwest bank.

Dropping over the Mill Pond Dam (Central Falls Dam), the Aberjona flows under the Converse Bridge on Main Street and enters a man-made channel alongside the Mystic Valley Parkway. It continues in this channel for 1/4 mile until it passes over a small dam at the USGS Gauging Station. Here it resumes a more natural course, flowing along the eastern edge of Ginn Field. The river flows under Bacon Street and widens into a portion that is a remnant of a mill pond

next to the Wedgemere commuter train station. The Aberjona River passes under the railroad for the last time, flows along the continuation of the Mystic Valley Parkway south of Bacon Street, and empties into the Upper Mystic Lake.

1.3.2 Survey Findings

The Aberjona River is quite a different river in Winchester, as compared to its character in Reading and Woburn. The reasons are a matter of history, as much as its being the lower and thus broader river section. Unlike in Reading and Woburn, Winchester's center was settled along the river. For the past 300 years the river has been the spine of Waterfield (as Winchester was called in 1830). The first house was built near the present Mill Pond dam in 1640, and the river has been the foremost geographic feature in the town center ever since.

Shortly after entering the Winchester town limits from Woburn, the river enters public parkland. For the majority of its length in Winchester, the river traverses public lands created over the past 125 years or so. While the river's natural course has been altered extensively, it has largely been the result of major landscaping efforts to create accessible parklands and parkways. Davidson Park and Leonard Park/Pond area are the first examples. After these areas, the river enters its only secluded stretch after it passes under the railroad and emerges about 1/2 mile later at Swanton Street. Recent housing developments have been built along the west bank, but the river is largely invisible in this section. (Note: The Village, a condominium complex with its main entrance on Swanton Street, owns not only the land along the river here, but also this section of the Aberjona River itself.)

South of Swanton Street, the river flows through public lands all the way to its mouth. Although the first 1/4 mile of this section is *under* the High School's athletic fields, there are pleasant and prominent stretches through the town center and along Mystic Valley Parkway. Near the Wedgemere train station, the river passes through an area that is not parkland but is public green space. The mouth of the river is at the beginning of the MDC-run Sandy Beach Park, on the Upper Mystic Lake.

a. Water Quality

The depth of the river in the Winchester section varied from one to two feet during a drought in the fall of 2001, which was normal to lower than normal. For most of this span, the river's flow was slight. There was no clogging aquatic vegetation in this section, but algae was evident around pipes at the lower part of the section from Cross St. to Winchester High School.

The river bottom was brown in color, mostly silt or sand and gravel. The water color was variously categorized by observers as brown to clear, tea-colored, cloudy, or muddy. Visible water quality was generally good. In all but one section, there was no odor present and no problem areas containing sewage, oil sheen, or scum. (The exception was in Davidson Park section, where both a musky/rotten egg odor and an oil sheen were noted.)

Many pipes (an estimated 32) connect to this approximately three-mile section of the Aberjona. Almost half of the pipes are stormdrain outfalls along Mystic Valley Parkway, a section that is a scant 1/4-mile long. In addition, at Wedgemere Station, there are five pipes in the west bank of the river. One of these had dark stains on it and an oily brown scum beneath it, as well as

unpleasant sewer odor. Discharge from a pipe near Faith Fellowship Ministries (located at 620 Washington Street) was also noted.

A significant concern regarding this section of the Aberjona is the crossing of major (Massachusetts Water Resources Authority (MWRA) sewer lines near the Wedgemere Station. A series of pipes that form a complex network of sewer culverts feeding the metropolitan area treatment facilities on Deer Island cross under the Aberjona River here. A siphon that allows the sewer to pass under the river in a U-shaped pipe allows the sewer line to travel down and under the river and then back up to the same underground level on the far side to effect a “down hill” flow. The problem with this technology is that it creates a bottleneck during high flow periods. On either side of the river, at the top of the “U”, is a covered portal that gives access to the siphon for cleaning and maintenance. During high flow, when the siphon (or the downstream sewer line) cannot accommodate the flow, these portals will overflow and raw sewage flows into the Aberjona and then into the Mystic Lakes and downstream to the Mystic River. The usual cause of this overflow is heavy rainfall when stormdrain water infiltrates the sewer line beyond its capacity. (Stormwater should be routed through its own system and kept segregated from the sanitary sewer. Old storm drains were sometimes connected to the sanitary sewer directly or were allowed to overflow into them.)

b. Bank Conditions

Trees and shrubs overhang the river for most of the length of the Winchester section and shade 70 -90% of the bank. The stream bank is predominantly shrubs and brambles, including such invasive plants as Phragmites, Purple Loosestrife, and Oriental Bittersweet. The exceptions are grassy banks at Davidson Park and in Winchester Center, where banks are park-like. Riparian vegetation includes primarily shrubs and grasses, with some lawn and park areas. Erosion was noted along most of the banks in the Winchester sections and the river’s flow was obstructed by fallen trees at five points.

The river in Winchester supports wildlife and fish habitat in seven pools and fourteen riffles, gravel stream bottom in spots, vegetation overhanging the banks, and fallen tree limbs and trunks. At the time of the survey (Oct./Nov.), songbirds, Mallard ducks, and Canada geese were seen, and evidence of rabbit was noted. At other times of the year, spawning fish and snapping turtles have been seen in the river. In particular, the mill pond near the Wedgemere train station attracts Great Blue Heron, Black Crowned Night Heron, Wood Ducks, Hooded Mergansers, and muskrat.

Land use (visible from the river) is mainly residential and park, with some industrial use. There are many lawns, parking lots, and roads along this section; their proximity presents problems with runoff into the river. There was also some trash runoff near the Transfer Station, Calvary Cemetery, the Village Condominiums, and the Wedgemere Station.

c. Access to the River

There is a good deal of public access to the Aberjona in Winchester. Davidson Park provides park and picnic areas, as well as a bicycle path. Judkins Pond and the Mill Pond in Winchester Center have walking paths along their banks. Along Mystic Valley Parkway, the river has a sidewalk and park area on one side and a dirt road on the other, both sides affording views of and

access to the river. Several other sections of the river provide informal access, such as the path along the river at The Village condominiums.

1.3.3 Discussion and Interpretation

The stretch of the Aberjona River that flows through Winchester adds to the pleasant setting of the town center and provides a valuable green space. There are many public access points along its approximately three-mile course, including three parks and paths for walking or bicycling. Several points of informal access exist as well.

The river also provides an excellent habitat for a variety of wildlife: Great Blue Heron, Wood Duck, and muskrat, as well as fish, turtles, ducks, and geese. Their presence adds to the appeal of the river as a green space.

For the most part, the water quality appears good. However, at one point there was an oily sheen in the river and discharge from pipes was noted at two locations. In addition, there are several areas along the banks where trash is a chronic problem.

While there has been evidence of the MWRA providing greater maintenance of its siphon in recent years, overflows still occur. The siphon has received some particular attention lately due to flood management studies in Winchester. The siphon creates a bottleneck in the river at this point and is blamed in part for flooding of Ginn Field.

1.3.4 Priorities for the Winchester Segment

- Remove trees and accumulated debris obstructing the river in 4-5 locations to improve flow.
- Investigate oily sheen near Davidson Park.
- Address discharges from pipes at Faith Fellowship Ministries and Wedgemere Station.
- Investigate dumping in area of Calvary Cemetery and arrange for a clean up.
- Work with the Winchester Conservation Committee and the Department of Public Works to control trash and debris from transfer station.
- Repair damaged storm culvert upstream of railroad crossing near Muraco School.
- Remove invasive plants, and organize plantings of native species.
- Check sources of pipes, and monitor for discharge during dry weather.
- Monitor salt content of river water (salt from sanding and salting of roads in winter).
- Evaluate eroding banks and repair.
- Advocate for sewer improvements and actions to increase flow.

1.4 General Conclusions

- The Aberjona River has a different character in each of the three towns through which it flows. In Reading, where it forms the headwaters of the Mystic River Watershed, the Aberjona is notable for its wooded surroundings; it flows through eight conservation areas, as well as residential neighborhoods. Through much of its Woburn section, commercial or industrial areas surround the river, with few undeveloped natural areas. In Winchester, the Aberjona flows through residential neighborhoods, several parks, and the town center.

- In all three towns, the river would benefit from efforts to raise awareness of its presence and value. In Reading, the Aberjona is almost invisible, surrounded as it is by conservation land or private property. Some residents were not aware that the river flows through or near their property. In this section of the river, however, public access is generally good. In Woburn, the river also is not very visible, but for a different reason: industrial and commercial development has resulted in paving of land adjacent to the river and at times confined the river to a channel or culvert. There also is very little formal access to the Aberjona in Woburn, but access does exist at one natural area and could be enhanced in other areas. Throughout most of its Winchester section, the Aberjona is visible and is a prominent feature as it flows through the town center. The river also has a number of public access points in this section. However, increased awareness of the river's benefit to the town is still needed, especially when considering actions on such issues as flood control.
- The river suffers from the effects of development and human activity all along its length. There is trash, runoff from parking lots and roads, and some water quality issues in commercial areas. In addition, sections of riverbank have eroded, disturbing banks and exposing tree roots. Wetlands have been invaded by such non-native species as Phragmites, Purple Loosestrife, Japanese Knotweed and Oriental Bittersweet. While these problems are present in all sections of the river, they are not overwhelming or insurmountable.
- Despite the deleterious effects of development and human activity, the Aberjona is a vital resource: visible water quality is generally good (water is clear and for the most part odorless) and the river supports a remarkable diversity of wildlife and vegetation all along its length. This vitality makes it a resource worth protecting and restoring in all three towns.
- Since problems occur to varying degrees in all three towns along its banks, solutions and actions would have the most success if formulated by a coalition of citizens, business people, and public officials from all three towns.
- While this report has described the Aberjona on a town-by-town basis, it is important to remember that the Aberjona is a single river. When addressing issues concerning the river, individual towns should consider effects on downstream or upstream sections and should coordinate efforts whenever possible.

1.5 General recommendations

- Present findings to local Conservation Commissions. Request that the Conservation Commission and the Department of Public Works for each of the Aberjona River communities act on the priorities cited in this report, specific to their community.
- Organize a *Friends of the Aberjona River* group to include members from businesses, municipal governments, schools and residents from the three communities, to advocate for river restoration and protection.
- Promote stewardship; challenge the residents of the Aberjona River communities to become stewards of the river and its shoreline.

- Promote education programs for residents, include lectures, walks and signage at significant river sites. Design brochures or fliers that promote the river. Make presentations to local businesses.
- Obtain funding for signage to identify the Aberjona River at public areas.
- Support efforts to develop and maintain greenways and trails in the vicinity of the Aberjona River, such as the Tri-Community Bike Path.
- Protect existing wildlife corridors.
- Train volunteers to conduct monthly river patrols, to monitor the river's condition, identify pipe and stormdrain problems, and conduct future river surveys.
- Organize a stormdrain stenciling program to help residents understand their connection to the river. (i.e. *Don't Dump: Drains to the Aberjona River*)
- Remove trash / organize local cleanups / address issue of dumping with local businesses.
- Conduct inventory of invasive plant species along the river. Remove invasive plant species and substitute native plantings to improve habitat and control erosion.
- Conduct a pipe survey in conjunction with each municipality. Monitor pipes during wet weather to determine whether there are flows.
- Conduct water quality monitoring.
- Publicize the findings of the US EPA Human Health Risk Assessment and Ecological Risk Assessment of the Aberjona River and act on the result.
- Expand the scope of the Upper Mystic Watershed Board to reduce flooding along the river.

2.1 Action Plan

ABERJONA RIVER STREAM TEAM RECOMMENDATIONS FOR ACTION

August 2006

Based on Shoreline Survey, October/November, 2001

Stream Team Vision:

Using this action plan as our guide, we strive to restore the river to a healthy state and to protect the river from the harmful activities that threaten it. Most importantly, through increased public awareness and education, we aim to create stewards who will ensure the protection of the Aberjona into the future.

Short Term Actions

Access and Recreation

1. Increase walking potential of area along Mystic Valley Parkway by clearing some invasive vegetation and brush. (Segment 23)
2. Clear some debris and invasive vegetation from in front of the Village Condo. Work with the Village Condo Association and the Winchester Conservation Commission to decide what to remove. (Segment 21)
3. Investigate potential for a walking trail near the Muraco School, with removal of a broken chain link fence. Use signage to identify area and connect it with Davidson Park.(Segments 19 & 20)
4. Enhance walking areas at Davidson Park and increase the signage - using kiosks or other material. (Segment 19)
5. Clarify the boundaries of conservation land near the cranberry bog in Woburn and mark the conservation trail. (Segment 17)
6. Investigate walking trails with a boardwalk through the cranberry bog lands, and increase signage. (Segment 16)
7. Encourage walking along the old road behind Planet Fitness. Talk with owner about access. (Segment 9)
8. Throughout the watershed, use signage to identify the Aberjona River at road crossings and other visible sites.
9. Check with the Woburn Conservation Commission about access to the Halls Brook Holding Area Pond. (Segment 14)

Pipes and Drainage

1. Recheck pipes from Mystic Valley Parkway during wet weather. (Segment 23)
2. Recheck pipes from Faith Fellowship Ministry during wet weather. (Segment 19)
3. Work with Woburn Conservation Commission on issues about land use at 60 Olympia Ave. Work with owners to add buffer to their property, or move bus parking from streambank. (Segment 15)
4. Recheck pipe behind 99 Restaurant for odor/scum. (Segment 13)
5. Identify source of flow from the pipe at Commerce Way in Woburn. (Segment 11)
6. Alert Winchester Conservation Commission to collapsed storm drain behind Muraco School. (Segment 20)

Trash and Cleanups

1. Work with the Winchester Department of Public Works to remove trash accumulating at the transfer station and to prevent it from going over the bank. (Segment 20)
2. Work with the Winchester Department of Public Works to move the compost piles from next to the riverbank to prevent runoff. (Segment 20)
3. Talk to cemetery caretakers about trash dumping along river at Calvary Cemetery. Suggest signage and a recycling/trash disposal area. (Segment 19)
4. Talk to the manager of the Fairfield Inn about the amount of trash overflowing from the dumpster. Ask for removal of the trash and grass clippings and material from behind the building. (Segment 13)
5. Talk to the Woburn ConCom regarding a fence on the embankment near I-93, Fairfield Inn, and the 99 Restaurant. The fence is holding back considerable debris, both natural and trash, and is very close to being overwhelmed. (Segment 13)
6. Work with Reading Conservation Commission to eliminate source of heavy sedimentation in storm drains. (Segment 9)

Long Term Strategies

Public Education & Awareness

1. Educate public about the areas of conservation land in all three towns and expand recreational potential for those areas.
2. Educate landowners in Reading sections about not dumping yard waste and not altering the riverfront area.
3. Use Davidson Park in Winchester as an educational resource, with interpretive signage and trails.

Trash and Cleanups

1. Conduct outreach to businesses in commercial areas of Woburn (Fairfield Inn, 99 Restaurant, Howard Johnson's, Ground Round, and others) to have them sponsor cleanups, and add trash containers and picnic tables to their property.
2. Conduct outreach to businesses and homeowners about proper disposal of yard waste and debris.

Long Term Visioning

1. Look at what is required for redevelopment of Wells G & H site. Find out EPA requirements to the town for reuse of the property.
2. Look at land uses on Olympia Avenue and their impacts on the river system.
3. Look at recreational potential for areas to be redeveloped.
4. Work with town of Winchester to enhance open space and recreational opportunities in town, and to enhance the riparian area with plantings, nest boxes, and other amenities.
5. Identify potential Supplemental Environmental Projects (SEP) in the Shoreline Survey Report and supply ideas to the EPA for potential projects in the watershed.

Adopt a Stream

Aberjona River Priorities for Action by Segment: 2001-2002

Problems Found	Assets Found	Priority Work to Do
<p>Segment 1: Headwaters, (Birch Meadow Drive), Reading: Joan Boegel and middle school students</p> <ol style="list-style-type: none"> 1. Orange sediment noted near H.S. 2. River is in culvert under playing field. 3. “Sludgy black water” noted in pipe near Tennyson Circle. 4. Oily sheen, patch of foam and waxy film- noted near soccer field. 5. Narrow channel. 6. Land uses near river: residential, ball fields, parking lots and roads abut sections at the headwaters. 7. Fallen tree limbs and trunks 8. Trash, litter. 	<ol style="list-style-type: none"> 1. Water is clear, shallow and areas of low flow. 2. Overhanging trees, shading the water / some plant diversity providing habitat. 3. Several bird species noted 4. Wooded sections downstream of HS and MS. 5. No runoff was noted. 6. Wetlands 7. Aquatic insects noted: aquatic sowbugs, gilled snails, and water striders. 	<ol style="list-style-type: none"> 1. Evaluate orange sediment in water near high school field 2. Evaluate oily sheen near John Carver Rd, and black water near pipe. 3. Remove fallen tree limbs. 4. Remove trash
<p>Segment 2: Headwaters, Reading: To be completed</p>		
<p>Segment 3: Headwaters, Maillet, Reading: Adrienne Rogers and Jan Dolan</p> <ol style="list-style-type: none"> 1. Fence blocks access near Route 129 2. Blocked culverts 3. Many downed trees 4. Signs of household dumping. 	<ol style="list-style-type: none"> 1. Water is clear, some areas of good flow. 2. Wetlands. 3. Extensive vegetation – both an asset, and a problem in areas where overgrown. 	<ol style="list-style-type: none"> 1. Improve access in areas where blocked. 2. Clear blocked culvert near Rte 129 3. Remove tree obstructions. 4. Remove dumping of household items. 5. Check brownish water near Willow St.
<p>Segment 4: South Branch, RR tracks to Arcadia St. (Thelin Bird Sanctuary), Reading: To be completed</p>		

Problems Found	Assets Found	Priority Work to Do
<p>Segment 5A: South Branch, Arcadia St., Reading: <i>Alberta Maged and Janet Kovner</i></p> <ol style="list-style-type: none"> 1. Eroding banks; exposed roots. 2. Large Purple loosestrife wetlands overwhelming cattails 3. Debris in water 4. Garbage (including tires, toys) collected in vegetation near wetlands 5. Runoff from lawns- houses and backyards just up the hill on the left bank 6. Large stand of Japanese Knotweed. 7. Question awareness of the river behind homes. 	<ol style="list-style-type: none"> 1. Forested area abutting river. Set back from houses and street. 2. Good habitat, woodpeckers etc., banks higher here 3. Flow was highest on this stretch of river 4. Some plant diversity. 5. Many bird species (and nests) spotted. Also signs of small mammals. 	<ol style="list-style-type: none"> 1. Stabilize banks 2. Remove invasive species, including loosestrife from wetlands. Allow native cattails to grow. 3. Remove trash, debris 4. Organize outreach program to local residents about dumping. 5. Post signs along the river. 6. Promote the river as an asset to local community. 7. Stormdrain stenciling
<p>Segment 5B: South Branch, Arcadia St./ Arnold Ave to I-93, Reading: <i>Alberta Maged and Janet Kovner</i></p> <ol style="list-style-type: none"> 1- Eroding banks; exposed roots. 2- Dense stands of phragmites, other invasive species 3. Dry stream bed, low flow in other areas 4. Trash 5. No signage showing the river. 	<ol style="list-style-type: none"> 1. Good access along trail between Arnold Ave and I-93. 2. Wooded section 3. Plant diversity: aspen, goldenrod, birches, buckthorn, tansy, staghorn sumac, bittersweet 4. Active beaver dam at I-93. 5. Cattails near dam, amidst the phragmites. 6. Water was deeper near the dam; channel was wider – spread out in wetlands. 	<ol style="list-style-type: none"> 1. Evaluate eroding banks; repair if possible. 2. Remove phragmites. Plant cattails / other native vegetation. 3. Organize cleanup along trail 4. Remove trees and debris from streambed. 5. Post signs along the river. 6. Talk with highway department about salt runoff from highway, near I-93.
<p>Segment 6: South Branch, I-93 to Commerce Way- Phillips Pond, Woburn: To be completed</p>		
<p>Segment 7: North Branch, Reading: To be completed</p>		

Problems Found	Assets Found	Priority Work to Do
<p>Segment 8 : North Branch, West Street – Upstream, Reading: <i>Fel Medeiros, June Mackenzie, Marlene Spears</i></p> <ol style="list-style-type: none"> 1. There is some dumping of yard waste from neighboring homes along West St 2. There is a "bridge" made of sticks, leading from one neighboring home to a dumping site for yard waste. If this is town land or conservation land, it might be appropriate to remove the bridge and clean up the dumped waste. 3. The bog bridge and the tire tracks along the right fork may not be appropriate use. If this is conservation land or town land, it is probably appropriate to try to remove the bog bridge and to block the vehicle access. 	<ol style="list-style-type: none"> 1. These wetlands are part of the flood control system. 2. The woods are fairly clean and appear to be part of a larger corridor of wildlife habitat. 	<ol style="list-style-type: none"> 1. Remind the neighbors why and how to properly dispose yard waste. 2. A general cleanup to remove some trash and yard waste (hopefully with the neighbors' help). 3. Block or restrict vehicle access to the northeastern portion of the property from West Street.
<p>Segment 9: North Branch, West Street, to Route 93 at Inwood Office Park, Reading: <i>Fel Medeiros, June Mackenzie, Marlene Spears</i></p> <ol style="list-style-type: none"> 1. Right at West Street, there is a heavy accumulation of sand. 2. There is litter near West Street. 3. There is a small section of stream with "oily sheen". We did not identify the source of the chemical sheen. 4. The right bank tributary had a foul smell. We did not follow the tributary back to its origins and cannot say whether it comes from Wilmington or Woburn, or somewhere else. 5. There appears to be no barrier to prevent plowed snow, road sand and salt from Route 93 from entering the river. 	<ol style="list-style-type: none"> 1. These wetlands are part of the flood control system. 2. The woods in the Xavier Conservation land are fairly clean and appear to be part of a larger corridor of wildlife habitat. 3. There is public access to the river via the Xavier Conservation land. 4. The section in the Inwood property has old stone walls and fruit trees. 	<ol style="list-style-type: none"> 1. Have Reading clean out the storm drains and possibly dredge some of the sand near West Street. 2. Have a cleanup of the Xavier Conservation land. 3. Check for the source of the oily sheen 4. Follow the right-bank tributary with the bad smell back to its origin and identify the source of the smell. 5. Check with Woburn ConCom about what the proposed Inwood development will do to the wetlands -- will there be public access to the river in that area? 6. Check with Mass Highways to see whether there are passive features of I-93 that keep plowed snow and runoff out of the river.

Problems Found	Assets Found	Priority Work to Do
<p>Segment 10: North Branch, Woburn Route 93 to Commerce Way: To be completed</p>		
<p>Segment 11: 10 Commerce Way to 30 Commerce Way, Woburn: <i>Janet Kovner, Marsha Turin, Marlene Spears</i></p> <ol style="list-style-type: none"> 1. There is flow into the river from a pipe at Commerce Way that appears to be some sort of organic-rich material. 2. The river is an open ditch in most places, and there is no awareness that the ditch is the Aberjona. 3. There is massive dumping of trash, yard waste, shopping carts, furniture, etc., into the ditch and into the river. 4. There is little or no public access, except via parking lots. 5. There is phragmites, bittersweet, and buckthorn all along the river in this section. 	<ol style="list-style-type: none"> 1. The Halls Brook Holding Area, which belongs to the ConCom, is a potential scenic area. 2. There are some stretches of the "ditch", accessible from parking lots that might provide passive recreation (e.g., picnic tables and footpaths). 3. The river is part of the flood control system. Maintaining and cleaning the wetlands here will help with flood control downstream. 4. The "weeds" along the river in this area appear to be possible wildlife habitat. 	<ol style="list-style-type: none"> 1. Identify the source of the flow from the pipe at Commerce Way and, if possible, try to find a way to clean it up. 2. Have DPW remove the midnight dumping behind Cabot Road. 3. Post signs that say "Aberjona River" on the river at Commerce Way, to remind people that it is more than just a ditch or dumping ground. 4. Ask the ConCom about access to the Halls Brook Holding Area and the sand pit south of Cabot Road. 5. Remind neighboring businesses why and how to properly dispose yard waste. 6. Encourage neighboring businesses to put up picnic tables (and trash bins) near the river. 7. Organize a general cleanup of the area to remove some trash and yard waste (hopefully with the neighbors' help). 8. Remove the phragmites and restock the area with native vegetation.
<p>Segment 12: 30 Commerce Way to Mishawam Rd., Woburn: <i>David and Linda Olsson</i></p> <ol style="list-style-type: none"> 1. Phragmites and Japanese Knotweed. 	<ol style="list-style-type: none"> 1. Nice path down berm but don't know if safe enough for public. 	<ol style="list-style-type: none"> 1. Stop businesses from dumping cuttings over sides of parking lots. 2. Remove invasives 3. Heavily controlled by EPA - don't know what more can be done.

Problems Found	Assets Found	Priority Work to Do
<p>Segment 13: Mishawum Rd. to I-93, Woburn: David and Linda Olsson</p> <p>1. Dumpster at Fairfield Inn is overflowing, trash piles and grass clippings 2. Pipe behind 99 Restaurant should be checked - flow on a dry day and rotten egg smell and orange scum and sediment at outlet.</p>		<p>1. Need restraint and trash removal and protection from future dumping at Fairfield Inn. 2. Investigate pipe</p>
<p>Segment 14: I-93 at MetroNorth Drive to Olympia Ave, Woburn.: Fel Medeiros, June Mackenzie, Marlene Spears</p> <p>1. The river is an open ditch in most places, and there is no awareness that the ditch is the Aberjona. 2. There is massive dumping of trash, yard waste, shopping arts, furniture, etc., into the ditch and into the river in the Industri-plex area. 3. There is little or no public access, except via parking lots. 4. There is flow into the HBHA that appears to be sewage.</p>	<p>1. The Halls Brook Holding Area, which belongs to the ConCom, is a potential scenic area. 2. There are some stretches of the "ditch", accessible from parking lots that might provide passive recreation (e.g., picnic tables and footpaths). 3. The river is part of the flood control system. Maintaining and cleaning the wetlands here will help with flood control downstream. 4. The "weeds" along the river in this area appear to be possible wildlife habitat.</p>	<p>1. Post signs that say "Aberjona River" on the river at Commerce Way, to remind people that it is more than just a ditch or dumping ground. 2. Ask the ConCom about access to the Halls Brook Holding Area. 3. Remind neighboring businesses why and how to properly dispose yard waste. 4. Encourage neighboring businesses to put up picnic tables (and trash bins) near the river. 5. Organize a general cleanup of the area to remove some trash and yard waste (hopefully with the neighbors' help). 6. Survey Wells G&H officially in Spring.</p>
<p>Segment 15: Olympia Ave. to Salem Street, Woburn: Bruce Benton and Wisam Al Haider</p> <p>1. Tree blocking flow 2. Parking lots (esp. truck firm) close to stream.</p>		<p>1. Address truck/bus parking area near Olympia Ave. Engine oil is a problem.</p>

Problems Found	Assets Found	Priority Work to Do
<p>Segment 16: Salem St. to Cranberry Bog, Woburn: <i>Bruce Benton and Wisam Al Haider</i></p> <p>1. Trash - bikes in the river</p>	<p>1. Wetlands, wildlife habitat at bog and around Olympia Ave.</p> <p>2. Bog walk area</p>	<p>1. Clean trash.</p> <p>2. Organize neighborhood.</p>
<p>Segment 17A: Washington Circle to Montvale Ave., Woburn: <i>Katherine Carlo and husband</i></p> <p>1. Trash</p> <p>2. Murky white water</p> <p>3. Concrete dam sections</p> <p>4. Oil sheen</p>		<p>1. Mark the conservation trail and clarify the boundaries of conservation area.</p>
<p>Segment 17B: Washington Circle to Montvale Ave., Woburn: <i>Jan McDermott and Nancy Eaton</i></p> <p>1. Trash, specifically near local businesses, (Spuds and Howard Johnson's)</p> <p>2. Spuds parking lot very close to stream (milky water near Spuds parking lot)</p> <p>3. Fertilized lawn near Rainin Company</p> <p>4. Oil sheen</p> <p>5. Purple Loosestrife, phragmites</p> <p>6. Houses close to water</p> <p>7. No wildlife seen</p> <p>8. Debris seen in stagnant areas</p> <p>9. Water level variable. Water murky in places.</p>	<p>1. Conservation area</p> <p>2. Trees overhanging stream</p> <p>3. Some native plants, cattails, asters, healthy trees.</p>	<p>1. Note proximity of homes or businesses to conservation land – some are marked but most are not.</p> <p>2. TRASH cleanup, particularly near Montvale Ave.</p>
<p>Segment 18B: Montvale Ave. (Woburn) to Washington St., Winchester: <i>Catherine Lowery; 0.3 miles upstream</i></p> <p>1. Little indication of animal life</p> <p>2. Some indication of unauthorized use</p> <p>3. Several areas of fallen trees and accumulated debris. Sand and debris in floodplain from past events.</p>	<p>1. Minimal use due to low flow, dams and floodplain.</p> <p>2. Primarily wooded areas and residential (most of abutting land is private property).</p> <p>3. One park area with path along Washington St.</p>	<p>1. Remove some of debris, i.e., plywood, drums, some brush.</p>

Problems Found	Assets Found	Priority Work to Do
<p>Segment 18A: Montvale Ave.(Woburn) to Washington St., Winchester: <i>Catherine Lowery and Jay Landers; 0.2 miles downstream</i></p> <ol style="list-style-type: none"> 1. Large pieces of metal and other trash in the streambed. 2. Impact of the pipes from the parking lots is unknown 3. Typical scene for an industrial property 	<ol style="list-style-type: none"> 1. No signs of dumping in the river 2. There is minimal use of this part of the river due to low-volume, restricted flow and limited access. 	<ol style="list-style-type: none"> 1. Remove accumulated debris to improve the flow of the river.
<p>Segment 19A: Washington St. to Cross St., (Davidson Park), Winchester: <i>Julie Kiang and Bill Maher</i></p> <ol style="list-style-type: none"> 1. Oil sheen 2. Loosestrife and Japanese Knotweed 3. Trash - dumping from cemetery, flower/pots, etc. 4. Pipes from Faith Fellowship Ministry, one directly from building, dry and another from parking lot. 5. Some small dams in the river 	<ol style="list-style-type: none"> 1. Davidson Park is well-tended. 2. An asphalt covered path, well back from the banks runs the length from Washington St to Cross St. 3. Large grassy conservation areas on both sides of the river; bike path. 	<ol style="list-style-type: none"> 1. This section of the river should not take priority over other sections. 2. Clean the trash 3. Investigate pipes and catch basins for runoff during rain. 4. Investigate oily sheen 5. Address the invasive plants 6. Investigate siltation in river.
<p>Segment 19B: Davidson Park, Winchester: <i>Justine Laugharn and Meg Sheehan</i></p> <ol style="list-style-type: none"> 1) Discharge from pipe from Fellowship Ministries 2) Dumping from Calvary Cemetery 3) Drain pipe from Washington Street 4) Garbage in waterway blocking flow 	<ol style="list-style-type: none"> 1) Nice area for recreation with bike path, picnic tables and grassy areas 2) Wildlife, especially birds, in area 	<ol style="list-style-type: none"> 1) Address open pipe issues. 2) Stop dumping in area of cemetery and clean it up 3) Clean up waterways of trash and debris

Problems Found	Assets Found	Priority Work to Do
<p>Segment 20: Cross St. to RR Xing near Muraco School, Winchester: <i>Bonnie Kwan Alice Warren Kara Brewton</i></p> <p>1. Access to and along stream</p>	<p>1. Large natural buffer (200'+) on both sides. 2. Great use and further potential use of park, recreational and conservation land. Particularly interested in area labeled "B" as potential forested open space.</p>	<p>1. Storm culvert #6 needs repair 2. Maybe walking trail could be established instead of chain link fence?</p>
<p>Segment 21: RR Xing near Murano School to Culvert at Winchester HS, Winchester: <i>Bonnie Kwan, Alice Warren, Kara Brewton</i></p> <p>1. Runoff trash down the slope and into river from town transfer station. 2. Invasive plants - phragmites and purple loosestrife 3. Beginning of aquatic plant growth near culverts 2-4 at the Village</p>	<p>1. Wildlife path noted in phragmites near culverts 2-4 2. Landowners using right side riverfront area passively and good observers of area at the village.</p>	<p>1. Control of trash and debris from transfer station. (contact DPW, cc to ConCom)</p>
<p>Segment 22: Winchester Center to Bacon St Bridge, Winchester: <i>Linda and Bruce Alexander</i></p> <p>1. 14 storm drain outfalls, all but 3 between Waterfield St. and USGS station (less than 0.24 mile stretch) 2. Vine-covered tree has fallen into river, constricting its flow.</p>	<p>1. Excellent suburban habitat for heron, mallards, mergansers, geese, kingfisher, other birds and muskrats 2. Provides good greenspace adjacent to Mystic Valley parkway. Open, accessible.</p>	<p>1. Remove tree constricting river 2. Monitor salt content of river water (salt from sanding/salting of road in winter).</p>
<p>Segment 23: Bacon St. Bridge to Mystic Lakes, Winchester: <i>Adrienne Rogers and Jan Dolan</i></p> <p>1. Fallen trees and overhanging bushes obstructing flow. 2. Filling in at edge and in center 3. Sewage inflow 4. Trash 5. Overgrowth, including bittersweet killing trees and restricting access. 6. Unsightly pipes, one with discharge</p>	<p>1. Graceful, beautiful, wild mix of vegetation. 2. Potential for good walking, canoeing, kayaking, fishing. 3. Beautiful water course when flowing.</p>	<p>1. Remove two large trees blocking flow. 2. Remove growth, overhangs blocking flow. 3. Evaluate eroding banks and repair. 4. Clear bittersweet and some undergrowth to save trees, improve access 5. Set regular trash cleanups in coordination with towns. 6. Check sources of pipes, monitor for discharge, remove or seal. 7. Push sewer improvement and actions to increase flow.</p>

Information Resources

Selected Websites

Adopt-A-Stream Program, MA Riverways

<http://www.mass.gov/dfwele/river/programs/adoptastream/index.htm>

Industri-Plex Public Health Assessment, Agency for Toxic Substances and Disease Registry

http://www.atsdr.cdc.gov/HAC/PHA/industri/ind_toc.html

Massachusetts Rivers Protection Act

<http://www.mass.gov/dep/water/resources/riverqa.htm>

MA Department of Environmental Protection

<http://www.mass.gov/dep/dephome.htm>

US EPA Baseline Human Health and Ecological Risk Assessment Report: Wells G&H Superfund Site Aberjona River Study, September 2004.

<http://www.epa.gov/ne/superfund/sites/wellsgh/213053.pdf>

US EPA Information about Wells G and H Site: Includes link to Wells G & H Fact Sheet

<http://www.epa.gov/region01/superfund/sites/wellsgh/index.html>

Selected Readings

Reading 350th Book Committee. *At Wood End: Reading, Massachusetts, 1644-1994, a Pictorial History*. Wakefield, MA: Item Press, 1994.

Durant, J.L. and K. Abbasi. *Watershed Management on the Mystic Watershed: Water Quality History and Challenges for the Future*. ASCE Watershed Management Conference, Ft. Collins, CO: 2000.

Chapman, Henry Smith. *History of Winchester, Vol. 1 and 2*. Town of Winchester: 1975. (Original edition: 1936).

McElhiney, John D. *Woburn, A Past Observed: A Civic, Social, and Political History of Woburn, Massachusetts*. Woburn, MA: Sonrel Press, 1999.

Sewall, Samuel. *The History of Woburn, Middlesex County, Mass. from the Grant of its Territory to Charlestown, in 1640, to the Year 1680*. Heritage Books, Inc., 1990.

Massachusetts Rivers Protection Act

Protecting the Commonwealth's rivers, streams, and adjacent lands

The Rivers Protection Act, Chapter 258 of the Acts of 1996, protects nearly 9,000 miles of Massachusetts riverbanks - helping keep water clean, preserving wildlife habitat, and controlling flooding. The law creates a 200-foot riverfront area that extends on both sides of rivers and streams. In certain urban areas, the riverfront area is 25 feet.

According to the law, the riverfront area provides the eight interests of the Wetlands Protection Act: protection of public and private water supply, protection of groundwater supply, protection of land containing shellfish, protection of wildlife habitat, flood control, storm damage prevention, prevention of pollution, and protection of fisheries. The law also establishes the policy of the state to protect the natural integrity of rivers and to encourage and establish open space along rivers.

The Rivers Protection Act is the result of many years of dedicated support from legislators and citizens across the state. Although several different versions of the law were proposed over the years, the final legislation took a measured approach to environmental protection - work in the riverfront area is not prohibited, but applicants must demonstrate that their projects have no practicable alternatives and will have no significant adverse impacts. Existing structures such as single-family homes and accessory uses are exempt from the Rivers Protection Act. The law does not create a new permitting process, but rather builds on the strength of the existing procedures under the Wetlands Protection Act. The local conservation commission or the state Department of Environmental Protection (DEP) reviews projects to ensure that the riverfront area is protected for the eight interests in the Wetlands Act.

Riverfront areas may contain wetlands and floodplains, as well as what have traditionally been considered upland areas. As a result, the features of the riverfront area vary by location: from asphalt and landscaped greenways in urban areas to woods, lawns, and farm fields in suburban and rural areas.

Riverfront areas protect water quality, stabilize stream banks, reduce flood peaks and downstream flooding, support fish and wildlife habitat, and protect groundwater. Even in urban settings, riverfront areas may provide flood control, storm damage prevention, and wildlife travel corridors.

The riverfront area

The riverfront area is a 200-foot wide corridor on each side of a perennial river or stream, measured from the mean annual high-water line of the river. However, the riverfront area is 25 feet in the following municipalities: Boston, Brockton, Cambridge, Chelsea, Everett, Fall River, Lawrence, Lowell, Malden, New Bedford, Somerville, Springfield, Winthrop, and Worcester; and in "densely developed areas," designated by the Secretary of the Executive Office of Environmental Affairs.

A river is any natural flowing body of water that empties into any ocean, lake, or other river and that flows throughout the year. The definition includes all perennial rivers, including streams and brooks that flow throughout the year. Rivers end where they meet the ocean, a lake, or pond. Intermittent streams are not subject to the Rivers Protection Act.

Riverfront areas prevent pollution by:

- * Filtering and trapping sediments, oils, metals, and other pollutants; and
- * Cleaning water through toxic chemical breakdown in soils and plant roots.

Riverfront areas protect public and private water supply and groundwater supply by:

- * Removing pollutants that are carried in runoff from nearby land uses, such as commercial areas, roadways, housing developments, and parking lots, before they reach surface water and/or groundwater;
- * Allowing water to infiltrate, or seep down into the ground, to replenish groundwater supplies and maintain base flows in streams and wetlands.

Over 60% of Massachusetts communities are dependent in whole, or part, on surface water as their primary source of drinking water. There are almost 200 public drinking water supply wells within riverfront areas.

Riverfront areas protect fisheries and land containing shellfish by:

- * Maintaining water quality by moderating stream temperatures, reducing erosion, and filtering sediments and pollutants, such as excess nutrients, toxins, and pathogens, before they reach rivers, and fisheries and shellfish beds that are important for recreational and commercial harvesting; and
- * Providing food sources to support the aquatic food chain.

Riverfront areas protect wildlife habitat by:

- * Providing food, shelter, and water for many plants, birds, and animals, such as black duck, eagle, deer, raccoon, otter, and beaver;
- * Serving as critical wildlife travel corridors, year-round and during seasonal migrations; and
- * Harboring rare or endangered plants and animals, such as the wood turtle.

Riverfront areas control flooding and prevent storm damage by:

- * Absorbing and storing water during storms and releasing the water slowly back to the river;
- * Reducing peak runoff during storms; and
- * Preventing erosion and sedimentation.

Participant Advocacy Groups

Friends of the Upper Mystic Lake is a neighborhood organization established in 1994 in response to a deterioration of the water quality of the Upper Mystic Lake. The Friends work collaboratively with the Winchester Boat Club, the Metropolitan District Commission (now the Department of Conservation and Recreation) and other environmental groups to restore, maintain and preserve the health and beauty of the lake.

Membership is open to anyone who shares the vision of the organization and wants to work on its projects. The primary projects include: continued support for the regular treatment of the lake with environmentally safe chemicals that retard the growth of nuisance aquatic vegetation, regular clean-ups of the lake shore, promotion of the use of environmentally-appropriate lawn chemicals on surrounding properties, and when necessary, political action on projects that will impact the lake, such as repair or replacement of the dam, and management of sewage and stormwater.

Woburn Residents' Environmental Network (WREN) is a group of volunteers whose goal is to preserve and protect Woburn's conservation areas, support community conservation activities like recycling and composting, and implement educational programs that develop a sense of environmental stewardship. Since its start in April 2001, WREN has organized many clean ups of Woburn conservation areas, planted daffodils at Horn Pond, started the Woburn Garden Awards, sponsored nature walks and participated in many community events. For more information, visit WREN's website at www.GoWREN.org

Mystic River Watershed Association (MyRWA) is a community-based, nonprofit organization, established in 1970 to protect and restore the natural resources of the Mystic River watershed. A highly urbanized watershed just north and west of Boston, the Mystic River watershed is approximately 76 square miles in area and includes all or some of the twenty-one cities and towns in the area. MyRWA stresses a philosophy of educated stewardship, increasing awareness of and appreciation for the natural resources in the watershed; fostering a watershed identity that encourages responsible behaviors; and advocating for improved public access for recreational opportunities, particularly in areas where residents have little or no access to the river. MyRWA accomplishes its mission by forging links with citizens' groups, universities, businesses, and government agencies. These alliances permit MyRWA to work throughout the watershed, to document current conditions, and advocate for resource management and protection. For more information, visit MyRWA's website at www.mysticriver.org