The Neponset's Urban Forest

A Survey

A report on the woody flora of the Neponset River corridor in Mattapan, Dorchester, and Milton

compiled for
the Boston Natural Areas Fund

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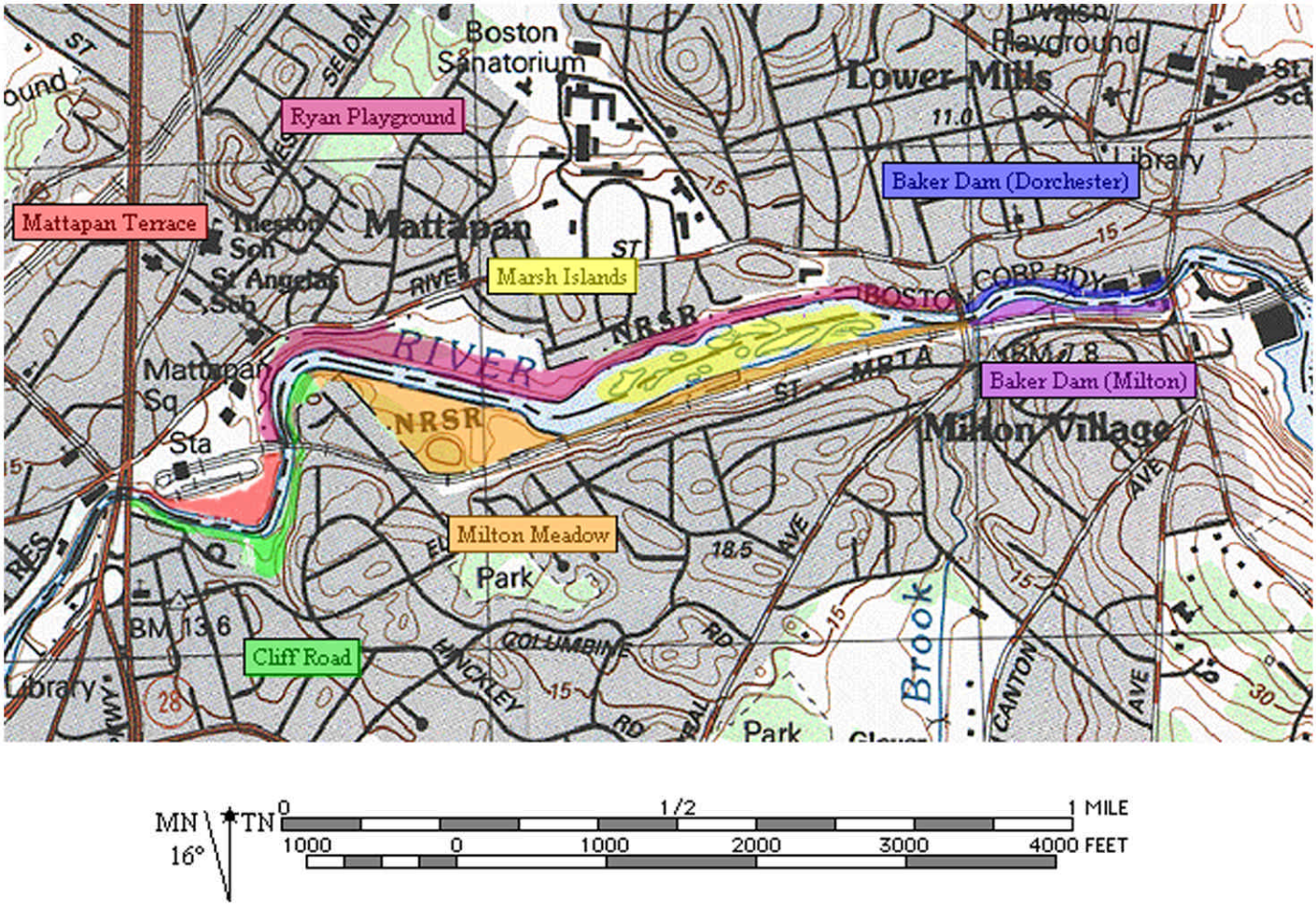
Map of Survey Sections



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INTRODUCTION

In the last few miles of its thirty-mile run from the hills of Foxboro and Walpole to tidewater at Boston Harbor, the Neponset River traverses a narrow, wooded corridor between Boston and Milton.

The corridor is wooded because of a century-old decision by the commonwealth to acquire land along the banks of Boston's rivers--the Charles, the Mystic, and the Neponset--and set it aside as public parkland.

But while the acquisitions along the lower Charles and the Mystic soon sprouted ballfields, walking paths, docks, and other improvements, the purchases along the Neponset were largely left untouched, partly because the working mills clustered on both banks in several spots made linking the parcels difficult, and partly because the parcels themselves were often narrow strips only a few yards wide, precluding extensive development.

In the meantime Boston continued to expand, and nearly all of the open land running back from the river in Dorchester, Milton, Mattapan, and Hyde Park was converted to residential, commercial, and industrial use. The river carried much of the wastes from these areas, and came to be regarded as something of a nuisance. The strips of parkland helped to shield it from view, and although some were taken for the construction of Truman Highway and the Neponset Valley Parkway, most were simply fenced off and left to themselves.

Interest in these parcels has been rekindled by the MDC's plan, now at last approaching fruition, to build a greenway along the Neponset from its mouth at Dorchester Bay up to Paul's Bridge underneath Blue Hill, a distance of about ten miles. Most of the mills in this stretch have long since shut down, and environmental laws passed since the 1970's have created a much cleaner river. But all parties concerned with the project have recognized that care must be exercised in developing public lands along the river, so that important functions they serve as wildlife habitat and riparian forest will not be lost. Toward that end the Boston Natural Areas Fund, which has been the MDC's most important partner in building support for the greenway, secured a grant last year from the MA Department of Enviromental Management for a survey of the existing forest along the Neponset, in order to better understand its condition. The survey was to identify all the trees and other woody species growing naturally in a representative section of the river corridor, describe the habitats these species occupy, and document the habitats with photos. This report is the product of that grant.

SURVEY AREA

The area surveyed includes all of the undeveloped corridor between Blue Hill Avenue and the crest of Baker Dam, a distance of about one-and-a-half river-miles. The river drops some twelve feet in this stretch, most of it in fast water at the upper end.

The width of the undeveloped corridor varies considerably. At the three major crossings in the survey--Blue Hill Avenue, the Mattapan MBTA bridge, and Central Avenue--it is restricted to the channel itself, while in the Ryan Playground area it expands to more than 600 feet. The width of the channel likewise varies, from a maximum of about 350 feet near the head of the Marsh Islands (where it splits to flow around a series of silty vegetated bars), to as little as 30 ft at the the MBTA bridge. The publicly-owned corridor, though nearly continuous on both sides of the river, is quite narrow in most spots, and hence the area surveyed (not including permanently flooded portions of the channel) is about 40 acres.

Since the survey focuses on natural areas, it omits the ballfields at Mattapan's Ryan Playground, even though they are MDC parkland. And although most of the survey area is MDC property, a few non-MDC parcels are included because they are contained in the wooded corridor--in particular the Dorchester bank from Baker Dam up to about 100 yards past Central Avenue, where strips of natural vegetation abut private homes and businesses, and also just upstream of Central Avenue on the Milton side, where the town owns a short stretch of bank between the channel and the MBTA tracks. These adjustments were made so that all the woods along the river would be included, while most developed areas would not.

In general, the survey area includes vegetated portions of the channel itself and whatever natural or semi-natural areas lie adjacent to it. The corridor is bounded upslope by roads, houselots, retaining walls, and various other features marking the edge of developed areas.

TWO FOREST TYPES

Almost the first thing one notices about the wooded banks of the Neponset in the survey (provided one gets past the chain-link fences that border them nearly everywhere!) is their uniformity: they slope up from the riverbed at a steep, smooth angle, and top out on soil-covered terraces that are nearly as level as sidewalks. This

very regular topography, so unlike natural conditions in our area, contrasts sharply with the dense, untended aspect of the woods themselves, which are so overgrown in many places that one can hardly get through them.

The terraces continue nearly throughout the corridor, as do the steeply pitched banks that support them. Evidently a major landscaping project took place here, a project that filled and leveled most of the parklands bordering the river. But this project had no issue, so to speak, in that the resulting terrain was simply left to grow up in woods.

The woods themselves are full of clues to this work. Though the terraced banks feature individual trees of many ages and sizes, one cohort is absent--big, old trees. And although some of the fast-growing species--cottonwoods, for example--are up to sixty feet tall, none are much bigger around than a phone pole, and no rotted stumps or deadfalls mark prior generations. Evidently, then, the woods are no older than the filled banks, and the date of the filling presumably corresponds to the maximum age of the larger trees.

One soon notices, as well, that the species composition of these woods differs markedly from that of typical local uplands. In any acre of forest in southern New England, for instance, most of the trees are likely to be oaks, but oaks are small and scattered on the fill-platforms, and nowhere dominate. Their place is taken by species that usually play minor roles in our woods--black cherry, black locust, elm, buckthorn, red ash, norway maple, and ailanthus. These trees are present nearly everywhere atop the filled banks, and in most spots one or more of them forms a dense canopy between thirty and sixty feet high.

There are a few places, however, where big oaks occur--primarily at the extreme rear of the fill platforms, or on portions of the riverbank where bedrock crops out. Many of these oaks are two feet or more in diameter, and are significantly bigger and older than any trees growing on the fill. These oaks are a giveaway; they flag portions of the river corridor that were left alone when the fill-platforms were constructed. Those now present near the water's edge survived, I believe, because there was no need to confine the river with a filled bank in places where bedrock ledges or retaining walls already did so. In other words, the point of the project was not so much to level the uplands beside the river, but to deepen and harden the existing channel, so that floodwaters would pass through the corridor as quickly as possible. The platforms are level because that was the treatment chosen for all the material dredged from the riverbed.

Although the platforms lie at least five or six feet above the level of spring floods, there are places where they are two or three times higher, presumably due to the amount of dredge spoil that had to be accommodated. There is no evidence that the river has ever overflowed any of them.

All told, the fill-platforms comprise about three-quarters of the naturally vegetated areas lying above the banks in the survey corridor. The platforms are easy to recognize because of their near-level surfaces, lack of exposed rock, and youthful forest cover dominated by species other than oaks.

THE FILL-PLATFORMS

The fill-platforms can be said to have originated somewhere off the coast of West Africa in August, 1955, where Hurricane Diane was born. Remnants of Diane stalled off the New England coast for four days later in the month, and dropped torrential rains on a region already saturated by a storm a week earlier. Widespread flooding killed 187 people in the northeast, primarily in the hilly interior, and caused over $4 billion in damage--totals matched only by Great New England Hurricane of 1938.

Though there was no loss of life along the Neponset, widespread flooding occurred in low-lying portions of Hyde Park and Mattapan. This flooding was attributed to ill-designed dams and other obstructions which prevented record flows from exiting a river corridor having more than enough slope to discharge them quickly. In response, the state legislature passed a $2 million bond bill in September, 1956, authorizing a major overhaul of the Neponset between the Fowl Meadow and Baker Dam. Some dams were to be removed, others were to be rebuilt, and the channel was to be deepened, armored, and otherwise altered so as to ensure that a flood 50% greater than that spawned by Diane would be contained within the banks. In addition, the MDC was authorized to oversee dams and regulate flows throughout the corridor, so that individual millowners could not jeopardize abutters with barriers and impoundments ill-equipped to handle large storms.

Presumably Howard Turner, the engineer who designed the plan, knew that hastening the flow through the corridor would increase flood levels downstream. Tidewater begins, however, immediately below Baker Dam, and the channel broadens tremendously into a salt marsh just a few hundred yards further, so that this effect would be limited to a comparatively small area around the Milton Village MBTA station. The station was indeed flooded at high tide during the storm of March, 1968, and the flooding was attributed to increased river flows (water backed up behind Baker Dam poured through the MBTA tunnel under Adams Street), but the upstream work, which had been completed by then, spared Hyde Park and Mattapan the sort of lengthy soaking they had suffered from Diane.

Nowadays flood control is viewed from a different perspective, and it is recognized that it is often cheaper and less damaging to retain floodwaters in natural wetlands upstream, rather than build costly sluiceways to speed them downslope. But in 1956 the MA Dept. of Commerce was still working on plans to drain and fill nearly the entire Fowl Meadow, and Turner's design for the lower river reflects that goal. It may be that Diane, which turned the Meadow into a lake eight miles long, convinced leaders to consider what the next storm might do after the Meadow was gone.

According to plans on file at the MDC's Document Room (Somerset St. HQ, Boston) the channelization work supported by the 1956 bond bill was completed in the survey area by 1963. It included lowering the riverbed by a yard or so and confining it between new banks composed of dredge spoil. The woods that have grown up on the fill-platforms are an inadvertent product of this work. They are now about thirty-five years old.

Although the fill-platform woods are easily distinguishable from the oak stands that persist on the unfilled areas, they are not uniform--indeed, in some places, particularly on the Milton side, repeated fires have prevented trees from coming in at all. In addition, the character of the fill varies, and the woods reflect this variation: in the upper third of the corridor, for instance, where the river runs swiftly, most of the spoil pulled from the channel was sandy, creating a droughty, well-drained soil favored by black locust and black cherry. Below Milton's Capen St., however, the fill had a much higher percentage of silt, and species preferring wetter soils tend to replace the locust and cherry: primarily elm, norway maple, and glossy buckthorn. The buckthorn is particularly successful in these areas, and oftenttimes not only dominates the canopy, but forms a dense thicket of saplings that nearly excludes all other growth.

Perhaps the two most characteristic species of the fill-platform woods are not trees at all: multiflora rose and garlic mustard. Both flourish in all but the densest shade. The rose, imported from east Asia in this century, forms sprawling clumps whose arching branches bear stout, triangular, clothes-ripping thorns that easily discourage casual walkers. The mustard is a European winter annual with small white flowers appearing in April; it is nearly ubiquitous on moist, disturbed soils around Boston.

Other low plants prominent in these woods are wood bluegrass, onion grass, and poison ivy. Only the ivy is native; the rest are imports. Indeed, the fill-platform woods can boast almost nothing in the way of native spring wildflowers--no violets, no wood anemone, no lady's slipper, no wintergreen, no mayflower. There are places where you'd be hardpressed to find any native plants at all.

The affinities of species found here lie much less with the river running beside them than with the typical flora of Boston's vacant lots and untended backyards. What

they demonstrate is how long-lasting the effects of major disturbances can be; nearly four decades after these platforms were built, there is little sign that they are returning towards a plant community typical of natural conditions. For that reason, I'd call them less sensitive than any other of the habitats in the survey--if they were cut down today, something much like them would doubtless grow up in their place.

THE OAK REMNANTS

About one-quarter of the uplands in the survey represent areas that were not filled during the early-sixties channelization project, either because bedrock ledges or retaining walls already protected the riverbank (and hence no filling and armoring was deemed necessary), or because they lay far enough back from the bank to lie outside the limits of the fill.

The unfilled uplands are concentrated in four areas, three of them on the Milton side:

1. A 30-foot puddingstone bluff that forces the river sharply northward at the bend below Blue Hill Avenue, and blocks its way for a fifth of a mile before it turns east again. (Milton)

2. A group of abrupt, gravelly knolls about 25 feet high occupying three acres at the corridor's landward edge east of Capen St. and north of the MBTA tracks. Covered in mature oak forest, this unfilled area extends north from the knolls about halfway to the river. (Milton)

3. The narrow corridor along the Milton bank, generally less than 50 feet wide, from a point about 500 feet upstream of Central Avenue down to Baker Dam. (Milton)

4. A section of bank from above Ledgebrook Road in Mattapan downstream about a fifth of a mile to just below Duxbury Road. (Boston)

These areas, though occupying only a small portion of the uplands in the survey, possess a number of distinctive features. They include all of its mature forest,

and nearly all of its large (over 70 ft) trees. They display the riverbank in a natural state without a covering of fill. In many spots the bedrock underlying the entire corridor, Roxbury puddingstone, shows through them. And they support a surprising variety of native plants, including several species scarce or absent on the fill-platforms and in the general area.

Consider, for instance, the following groups of trees:

> Black Locust, Black Cherry, Elm, Buckthorn, Ailanthus, Apple, Norway Maple
>
> Shagbark Hickory, White Pine, Tupelo, Sassafras, Beech, Witch Hazel, Hackberry, Dogwood, Pin Cherry

The first group is typical of the fill-platforms, and one or more of these species is likely to dominate any untended lot, yard, or alleyway in Boston, even though all but the cherry and elm are non-natives. The second group, in contrast, is present in the survey only in the oak remnants, and comprises native species typical of undisturbed woodlands, and scarce in urban areas.

A similar division can be made between the shrubs, herbs, and grasses characteristic of the two forest-types:

> Multiflora Rose, Garlic Mustard, Poison Ivy, Highbush Blackberry, Japanese Honeysuckle, Wild Garlic, Wood Bluegrass
>
> Shadbush, Maple-leaved Viburnum, Highbush Blueberry, Hillside Blueberry, Lowbush Blueberry, Canada Mayflower, Pennsylvania Sedge, Sweet Pepperbush

Once again the first group (from the fill-platforms) contains mostly aliens characteristic of disturbed areas, while the second (from the oak remnants) is made up of upland natives generally present only in woods that have not been altered for quite a while. Though there are a few species shared by both forest-types (red oak, white wood aster, red ash, greenbrier), for the most part they are mutually exclusive, making the types easy to distinguish even without differences in topography.

Given the highly-developed nature of the river's surroundings, the suite of species associated with the oak remnants is something of a surprise, botanically speaking, and permits one to imagine what the forest here might have looked like

centuries ago. Insofar as the parklands along the river are intended to preserve natural scenery, the oak remnants have a special value, despite their modest extent.

MILTON MEADOW

Not all of the undeveloped upland in the survey area is wooded. A large, triangular field of about four acres occupies the fill-platform above the Milton bank just upstream of the head of the Marsh Islands. This field, separated from neighborhoods along Eliot St. by the MBTA tracks, I have called Milton Meadow, and I've named the entire south-bank section between Capen St. and Central Avenue after it.

The four-acre Meadow would today be as densely wooded as the rest of the fill-platforms if not for the kids who have repeatedly torched it over the last thirty years. Fires kill some young trees and prune others back to their roots, so that they can't outstrip competing grasses and herbs. The result is a delay in the normal progression of any cleared upland in our area toward mature forest; woody growth is disadvantaged, and a dense cover of herbaceous or grassy vegetation can persist indefinitely, just as if the area were regularly mowed.

Fires have doubtless been lit many times all over the fill-platforms since their construction—one burnt a quarter-acre or so of underbrush beside Ryan Playground in the summer of 1997—but Milton Meadow is the only place in the survey's uplands where fires have prevented trees from invading a large area.

Although no fires occurred in the Meadow in 1997, signs of previous burns are evident in many spots, including charring visible on young cherries and locusts at the east end, and the shrubby, multi-stemmed growth-form of red maples and buckthorns invading the west edge, indicating that they've bounced back from suckers after their leaders were killed. Milton's Frank Courtney, who has lived at the north end of Capen St. since the 1950's, told me that fires formerly traveled westward up the fill-platform from the Meadow nearly as far as his property, but that in recent years the woods have grown in quite a bit in that direction, so that they don't reach nearly as far. I heard from a woman living directly across the tracks from the Meadow along Eliot St. that burns in the Meadow were commonplace, but had never threatened her house, since they couldn't leap the broad railbed.

It's likely that fires occur more often and affect larger areas in and around Milton Meadow precisely because of its relative isolation from streets and houses,

compared to the corridor on the Boston side. There are fewer access points for firefighting equipment, and fewer bottlenecks where a burn might be blocked.

In recent years fires have not kept pace with woody growth in the Meadow, and it is shrinking rapidly along its west border, where dense thickets of cherry, buckthorn, gray birch, and red maple are invading formerly open areas. All these species have the ability to sprout from their roots after a burn, and so have an advantage over trees like elm, ash, and white pine, which die if killed to the ground.

One could wish that the kids who start the fires had been a little more active lately, since the Meadow's open habitat is scarce overall in the survey, and, in addition to its attractive, parklike appearance, provides many benefits for wildlife. The river's turtles crawl up to the Meadow to nest, since their eggs require sunny, well-drained soils. Cottontails, woodchucks, and other small animals find more food here than in an equivalent area of woods, and may become less common if it grows in.

The Meadow is currently dominated by lush stands of perennial grasses—primarily deer-tongue, little bluestem, hairgrass, and bluejoint—along with extensive patches of meadowsweet and highbush blackberry. Several large crabapples at its northwest corner bloom more showily here than anywhere else, and a trail that borders it along the riverbank affords good views in several directions. Any plan to optimize habitat throughout the survey should include provisions for keeping the Meadow open, perhaps even via controlled burns, so that the corridor's variety of habitats can be preserved.

THE RIVERBANKS

The Neponset's banks have been heavily altered throughout the survey area, so much that it's difficult to say, today, what the river's original course may have been.

The most recent changes date from the MDC's early-sixties channelization project, which entailed construction of new banks along most of the corridor. These banks were built to resist erosion and confine the river within its channel even during floods. They're easy to recognize because they have a constant slope of about 1:2 (steep enough if you're trying to clamber up them!), along with smooth, regular faces usually covered with soil, and interrupted at intervals by stormwater discharge structures.

On the Boston side these structures are 15-inch diameter clay pipes emerging halfway up the banks from faceplates of fitted stone; on the Milton side they are

usually narrow, steep-walled open ditches about four feet deep paved with asphalt below, and running out across the fill platforms.

The filled banks are normally six to ten feet high, though they go up to fifteen or more on the Milton side below Capen St., where the amount of dredge spoil they were meant to contain, along with the existing relief, evidently necessitated building them higher. They are faced with boulders up to three feet in diameter, though a dressing of soil generally hides these rocks except at the base of the bank, where spring floods expose them. The only place in the survey where one of these banks has been entirely denuded is on the Boston side just above Ryan Playground, where a flood of sewage exiting a manhole beside River St. during heavy rains in October, 1996 rushed down it and scoured away all the dirt, leaving a jumble of rocks.

The filled banks are heavily vegetated in most spots, and their vegetation is not much different from that present in the areas where exposed ledges replace them. A vertical zonation is evident, with species tolerant of saturated soils and occasional flooding dominating the banks lower portions, and upland species more prevalent above.

This zonation is particularly pronounced along the west side of Ryan Playground, where a neat row of red maples stands about a yard down from the top of the bank. These trees, regularly spaced along the spring high-water mark, give the appearance of having been planted, but probably reflect a narrow band of optimal conditions. Perhaps, when the bank was new, maple seedlings sprung up all along it, but only these succeeded, having better access to water than the ones above, and greater protection from floods then those below.

A row of evenly spaced maples also lines the high-water mark on the Milton bank in this area, bordered upslope by the grassy expanse of Milton Meadow, but red maples are by no means the only trees present low on the banks throughout the corridor—elsewhere they are joined by cottonwood, gray birch, river birch, elm, red ash, silver maple, and a scattering of various willows. In contrast, there is a larger group of trees that, although common in the corridor, never occurs so close to the water's edge: black locust, black cherry, norway maple, boxelder, aspen, oak, apple, mulberry, catalpa, hackberry, and ailanthus. Hence all the trees in the survey can be classed as either riparian or not, depending on whether they grow midway down the filled banks or lower, where the river's influence is strongest,

Although upland species dominate the survey, the filled banks provide plenty of habitat for their riparian counterparts, which are presumably better able to withstand saturated soils and occasional flooding. Thanks to the abrupt slope of the banks, this wooded riparian zone is only a few yards wide in most areas, but it is almost continuous throughout the survey, disappearing only in those spots where retaining walls or steep ledges interrupt the banks. Evidently, then, the effect of

channelization was not so much to eliminate the riparian zone as to narrow it and confine it to the lower halves of the filled banks. These were quickly reoccupied by trees tolerant of intermittent flooding, most of them probably arriving as seeds stranded at waterlines.

The lower banks resemble the oak uplands in that they are dominated by native species, despite their artificial origin. Nearly everywhere along them a trio of erosion-resistant native shrubs—silky dogwood, arrowood, and false indigo—form a dense, head-high tangle just below the spring high-water mark, and are thinned out upslope by some combination of cottonwood, ash, red and silver maple, willow, and gray and river birch. Along the south-facing Mattapan bank below Ryan Playground, where the channel widens into the Marsh Islands, abundant sunlight supports an additional vegetative layer: high-climbing vines. Here grape, bittersweet, and greenbriar invade the treetops, and grow so thickly that they nearly obscure them.

Nowhere is the channel so narrow that trees growing on opposite banks can bridge it with their limbs, and so there is always a clear, light-filled space over the water, a space that the trees reach out for, and will eventually pitch into, when their drowned crowns will provide good hideouts for sunfish and perch. Maybe their roots will even yank out a few buried boulders, and begin to disassemble the filled banks.

How does today's riparian forest differ from that which existed before the banks were filled and armored thirty-five years ago? There was probably more of such forest then, because the slope of the banks in most places was more irregular and less pronounced, and hence a greater area was intermittently flooded. Nonetheless, the channelization by no means eliminated the conditions that create riparian forest. The lowest portions of the new banks are, like the banks of a natural stream, alternately scoured by spring floods and bared by low water. Certain trees, most of them native, are adapted to colonize and flourish in such habitats, and since the Neponset continued to create them, it reclothed itself in riparian forest. If it had been the aim of the engineers to prevent this recovery, they would have had to bury the banks in concrete.

Forests can take centuries to mature, however, and the new banks are young. They probably exhibit a bias toward those riparian species—gray and river birch, for example—that scatter seed wholesale to wind and water, and thus can rapidly colonize new substrates. It may be significant, for instance, that one of our most beautiful wetland trees, tupelo, occurs nowhere on the filled banks, but is limited to a few spots—Cliff Road and the lower end of Milton Meadow—where the older bank has survived. Tupelo produces a limited number of large, oily, energy-rich, one-seeded fruits that are dispersed by birds, and it may be many years, if ever, before the small stock of existing trees produces descendants on the new banks.

FLOODPLAIN FOREST

Most rivers regularly overspill their banks. If they did not, all the sediments they carry would transit directly to the ocean, and every little brook and stream in Massachusetts would continue downcutting its channel till it resembled a miniature Grand Canyon.

As it is, however, nearly all our streams slow down now and then on their way to tidewater, and let go some of the gravel, sand and silt they have brought down from upstream. They do most of this earth-moving in late winter and spring, when their flows are highest. Before we blocked them with dams, and encased them in concrete and stone, they dropped much of this baggage on and over their banks. In this way the low spots along their courses became net receivers of sediment, and much of what was scoured off their uplands wound up in their bottoms.

In theory, these low spots keep filling until they reach a level adjusted to the height of their outlets, at which point the increase in sediment stops, because the river carries out about as much as it brings in. This state is known as equilibrium, and all rivers supposedly move toward it.

I only mention this in order to suggest that overbank flooding is a normal springtime event along low-gradient portions of most rivers—it is the process by which floodplains are created—so that efforts to keep a river within banks year-round (such as the channelization work in the survey area) run counter to a stream's ordinary behavior, and transform it into something else.

How much natural floodplain did the flood-control project eliminate along the Neponset between Blue Hill Avenue and Baker Dam? The short answer is: all of it. If floodplain is defined as an area of low relief submerged by a watercourse in spring, but later exposed as flow declines, then the project had no place for it; it intended the river to rise and fall entirely within the abrupt walls of its new channel. And if the definition is further qualified to refer only to flood-prone areas lying outside or beyond a watercourse's banks, then the corridor still has no floodplain today, because the banks are never ordinarily overflowed.

It is fortunate, then, from an ecological point of view, that the project's engineers had a protected corridor considerably wider than the river to work with—removing any need, in most places, to squeeze the river into the smallest possible channel. It appears, in fact, as if they extended the new banks only as far as was necessary to accommodate the volumes of sediment required to be removed from the bed, and gave the river however much of the corridor remained.

The result was a channel that, although squeezed to 45 feet at Blue Hill Avenue, and to 30 feet at the MBTA bridge, averages over 100 feet wide, and swells to 200 feet or more in spots. These widths, although considerably narrower than those existing before the project, are still great enough to allow the river to spread out, and lose speed, and deposit quantities of sand, silt, and gravel brought down from upstream.

These deposits are usually flooded in winter and spring, but are high and dry for a good part of the the growing season. They begin at the inside of the sharp bend below Blue Hill Avenue, where they form a gravel point bar, and continue intermittently all the way to the head of the Marsh Islands. Most of them have been colonized by trees, and though they are new land, and an artifact of the flood-control work, they go a long way toward replacing the floodplain habitat that was destroyed.

Only a few tree species can tolerate the prolonged inundations that these bars experience. In general, they're the same species that occur on the lower portions of the filled banks: river birch, red and silver maple, red ash, elm, cottonwood, and various willows. In some places they form dense same-age stands; in others they're widely scattered.

River birch probably outnumbers all the rest, and is the species that seems most closely adapted to such habitats, in that it almost never occurs elsewhere. The ragged, papery, salmon-colored bark on young trees is highly distinctive, and, unlike other birches, this species rarely suffers from leaf-miners. It is a Neponset specialty, apparently found no higher upstream than Paul's bridge, and uncommon elsewhere in Massachusetts.

Late in the the drought summer of 1997, all the gravel bars from the MBTA bridge down to the bend above Capen St. were carpeted with fluttering three-inch forests of birch seedlings, interspersed with tiny cottonwoods of similar size. The floods that followed in early 1998 probably swept away all of them; they may need several dry years in a row to become established in their preferred habitat.

Between Capen St. and the head of the Marsh Islands the channel-edge bar is mostly confined to the Milton bank, and is softer and siltier than above, in keeping with the river's reduced gradient. This substrate seems less hospitable to trees than the gravel and sand found higher, perhaps because it stays saturated longer, and so inhibits oxygen uptake from roots. Here willows of various types dominate, along with silver maple. This curving bar, about ten yards wide, may be the prettiest spot in the entire survey, since, in late summer, the open glades between the leaning, half-recumbent trees support a lush growth of tall herbs, which give way easily as one wades through them to the sunlit, sand-bottomed river.

All the point bars and gravel islands in this area are younger than the 30-year-old channel work, and it's hard to tell what they might look like when their

first generation of woody inhabitants is history. Further down, however, a bit of floodplain survives from before the project, and it perhaps gives a clue to what these bars might become.

This three-quarter-acre patch of floodplain extends into the river from the Milton bank just below Central Avenue and the outlet of Pine Tree Brook. It appears on the original Park Commission maps dating from about 1900, and lies downstream of the fill-platforms, which peter out near the lower end of the Marsh Islands.

Today it is fully wooded, though none of the red ashes dominating it is higher than 70 feet, or more than ten inches in diameter, indicating some cutting within the last fifty years. Though these woods are dry in midsummer, springtime floods sweep their soils bare. In contrast to the bars at Capen St., not much light penetrates the dense canopy, and herbaceous growth is sparse, with grapes and greenbriar ascending high up in the trees.

Here you can find the largest river birch in the survey—21" thick at chest height—and a few rare beeches and white oaks on the higher spots. People camp here in warm weather, and leave their bottles and bedding behind. A low curbing of fitted stones at the water's edge indicates that the spot once received concentrated attention, its purpose lost today.

This overgrown patch of woods is probably the nearest the corridor can boast to mature floodplain forest—the kind of forest that is regularly soaked by a fast-flowing river—but I confess to have very little idea of what such forest should look like, since it requires to be left alone, and that's more than we have been able to do anywhere around Boston.

MARSH ISLANDS

Like a snake that swallowed a rabbit, the Neponset bulges hugely in the survey's midsection. From Ryan Playground down to the River St. shopping center, a distance of a third of a mile, the channel nearly doubles in width, reaching over 300 feet at its widest.

This elongate basin was dug out sometime prior to 1888 (it appears on a map from that date), most likely to provide additional water for the Jenkins Dam, which spanned the channel near the spot where it abruptly narrows again beside the shopping center. The original Metropolitan Park Commission takings maps from 1900 (when the Neponset River Reservation was created) show a large building on the site of the

center called the Tileston & Hollingsworth Mill, and the 12-foot dam was attached to it, storing water for an inlet that ran under the mill.

The Jenkins Dam was badly damaged by the river's historic peak flood associated with Hurricane Diane in 1955, and it was removed soon afterward, emptying the reservoir and exposing all the sediments it had collected. These sediments occupied a much wider corridor than the river could scour, and so it carved channels through them, and left several boat-shaped remnants as islands, which were subsequently colonized by marsh grasses and other vegetation. Today about sixty percent of the former twelve-acre reservoir is occupied by these grassy islands, while the braided river channel flows through the rest.

Local river-watchers have taken to calling these in-channel marshy plateaus "the Rice Islands"—something of a misnomer, since no wild rice occurs on them. Here I'll call them the Marsh Islands.

Though the river typically overwashes the islands in March and April, it doesn't carve away at them much, thanks to the rooty and tenacious mat of dormant grasses and shrubs that caps them through the winter. The most that the current can apparently do is undercut them a bit, and expose the yard-high pedestals of silt that they stand on. I would guess, then, that the existing channel/island configuration is stable, and may be decades old. Indeed, if you walk out on the islands after the flood has receded, but before they've greened up again, you can find low spots along their upstream margins where the river has ridden up over them and spread ragged carpets of silt over their combed-flat cover of dead grass—silt which another year's growth will incorporate into the soil. Here, it seems, the opposing forces of erosion and sedimentation have reached a standoff, thanks to a vigorous plant community. The river could never create such high, silty islands here on its own, but now that they exist, it seems that they're not going away.

One is reminded of what happens to a beaver pond after the nearby forage runs out; the beavers depart, the stream breaks down the unattended dam, the pond drains away, and a moist meadow appears in the woods.

The most common and pervasive plant on the Islands is a blue-green, head-high, wide-bladed native perennial rhizomatous grass called reed canary grass. It forms a dense turf more or less all over them, and flowers in early summer. The only other species nearly so abundant are purple loosestrife, which fringes the islands and dominates muddy backwaters and flats, and false indigo, which creates dense, shrubby thickets atop the islands' streamlined prows, and occurs spottily elsewhere.

In early May the first spiky blades of the grass poke up through last year's thatch, and thousands are nipped off and swallowed by several pairs of Canada geese that nest on the islands. The grass shoots up rapidly regardless, and by early summer has completely obscured the discarded tires, milk crates, and old snags scattered across

the Islands, making them a bit treacherous for walkers. Once the grass starts to flower its growth slows, and by late summer it is lax and worn out, allowing a suite of late-blooming herbs to push up through it: New York aster, orange jewelweed, field bindweed, Pennsylvania smartweed, and tangled skeins of pumpkin-colored dodder. These grow thickly as well, and their massed blossoms make the Islands into oases of new growth in September, when most of the greenery in the adjacent woods is long since stale, faded, and chewed.

Trees seem to grow well on the islands, but are few and far between: a catalpa, a solitary red maple, a clump of river birch, and a few pussy willows. Curiously, nearly all are young adults in the 10-20 foot range, with no saplings or older individuals apparent. The Islands' dense, deep turf no doubt discourages seedling establishment, and, as with the gravel bars upstream, a dry 2-3 year window favorable to early growth may occur only once every decade or so. It could be that all the existing trees date from such a window in the late eighties, when a fire may have cleared room for them.

Two of the three largest islands are not really such, being attached to the filled banks by silted-in backwaters where cattails, yellow irises, and beggar-ticks flourish. These are accessible by foot once the spring flood recedes, though hardly anyone visits them.

The valley is heavily wooded on either side, and if you stand at the channel-edge, and look up and down the river, you can see hundreds of yards in either direction, but there's not a car or a person in sight. If not for the MBTA rattling through the Milton-side woods every few minutes, or the shouts of kids drifting down from Ryan Playground, you might think you were somewhere else entirely.

PROSPECTS

The Neponset's rich industrial history is just that—history. So is its former importance for Native Americans, who gathered to feast on its springtime bonanza of returning herring and shad. Its heyday as a regional toilet and waste dump has likewise passed, as has its usefulness for carrying Maine lumber or Pennsylvania coal to Port Norfolk and Milton Landing. Every generation that lived on its banks inherited a different Neponset, and each routed it, in turn, through new channels of need and desire.

We look to the river for redemption, perhaps. We want to rescue it from an attitude that regards land and water as the fuel we burn on our way to the supermarket.

That river, we say, doesn't go where we want to go; it leads to culverts slick with oil, and fish nobody can eat, and a kind of hopelessness masquerading as activity.

No doubt a river loses something when it becomes an orphan. To do the fieldwork for this project, I parked in the neighborhoods alongside, and when people saw me shoulder my backpack, and pull my tripod from the trunk, and disappear down an embankment or behind somebody's garage, they got curious—sometimes, when I returned, they asked me where I'd been and what I'd been doing, and when I said "Neponset," they looked confused. They knew that there was a certain amount of water down there past the barbed wire and poison ivy, and some had noticed that it flowed in one direction, but few could say what it was called, or where it went, or who it belonged to, or why anybody should be interested in it.

This is no mean trick—to take a thirty-mile river and hide it so well that people living right on it can't utter its name.

Here, then, I'd like to suggest a few points to consider in light of the dawning sense that the river can and should be linked to our various inner and outer landscapes, and made into an oasis and thoroughfare for people and wildlife. These notes occurred to me in the course of research for this project, when I spent a lot of time along the river and got a chance to look at it closely.

Perhaps the first thing to be said is that the value of the century-old public purchases in the corridor hasn't diminished, despite subsequent neglect. On the contrary—if these purchases had not occurred, the river would now run like a drain between the backsides of a near-continuous series of apartments, businesses, and parking lots, its banks buried under trash and retaining walls, as in many areas above Blue Hill Avenue. The purchases gave the river space to retain its own character, and ensured that when the time came to make parks, there would be some river to make them with.

Another point: the river runs freer today than it did a century ago, because three of the four obstacles then present in the corridor are gone—two low timber dams just below Blue Hill Avenue, and the high Jenkins Dam at the River St. shopping center above Central Avenue. More than either the Charles or the Mystic, the Neponset is still a river in Boston, with a river's whims and moods, and a river's active role in constructing and maintaining habitats alongside it. If, as is contemplated, Baker Dam is breached also, Boston and Milton will present the remarkable spectacle of a free-running stream coursing through what was once the most heavily industrialized area in North America.

The quality of riparian habitat in the corridor suffered greatly from the channelization work undertaken following Hurricane Diane. This work was probably unnecessary, since there is nothing in the record indicating that flooding occurred between Blue Hill Avenue and Baker Dam, or that the work relieved flooding

elsewhere (it has not). Here's a clue to what little regard the river received—it was completely made over without, it seems, any formal assessment of either the need for such work or its likely effects on public resources and property.

This work eliminated nearly all the wetlands along the river, and the new floodplain areas that have subsequently appeared in the channel have not made up for the loss. Kevin Scofield, a Walpole resident who grew up in Mattapan, told me that prior to the project a large stretch of forested pools and backwaters existed beside the river in the Ryan Playground area (then known as the Liversidge estate), and that it was full of aquatic life. Several species of reptiles and amphibians typically common in such habitats, and abundant upstream in the Fowl Meadow—green frogs, bullfrogs, American toads, and water snakes—are rare or absent in the corridor, and may have been extirpated by the channel work. These species could likely be restored to the area if pools of various depths were excavated in the fill-platforms, so that the former variety of habitats was approximated.

The project degraded water quality in the corridor by adding dozens of storm drains designed to discharge directly into the river. The new MA Rivers Act explicitly recognizes that one of the chief values of naturally-vegetated riverbanks is their ability to block the movement of pollutants contained in runoff toward waterways. Any proposal to redevelop the corridor for parkland should include provisions to reroute stormwater to take advantage of this ability, perhaps via detention basins or constructed wetlands.

Completion of the proposed bikepath atop the fill-platforms will probably not reduce the corridor's value for wildlife if clearing occurs primarily along the path itself, and if dogs are required to be leashed. If the path crosses the river, it should be raised on piles at least a yard above the spring high-water mark, and it should not debouch onto the marsh islands.

Although no state-listed rare plants apparently occur in the corridor, those associated with the unfilled banks and ledges—tupelo, flowering dogwood, sassafras, hillside blueberry, pepperbush, hackberry, and so forth—are locally scarce, and should receive priority for preservation. The flora of the fill-platforms, in contrast, is dominated by weedy and invasive species unlikely to be eliminated even by determined efforts. Any areas dominated by, for instance, multiflora rose or Norway maple would be good candidates for either ornamental plantings (apple, shadbush, viburnums) or restoration with local species (oak, white pine, sycamore).
Despite marked improvement in the river's water quality in recent years, virtually no submerged aquatic plants occur in the survey. It would be interesting to investigate why, and explore opportunities for bringing them in (some now can be found as far downstream as the Truman Highway bridge in Readville).

The river follows a narrow ribbon of green through dense and populous neighborhoods in Boston and Milton, and it should not be expected to develop an ambience like a stream in the Berkshires. But its free-flowing water and variety of undisturbed habitats are more reminiscent of the Blue Hills Reservation than of Boston's Esplanade or the Fenway, and these are rare and vulnerable qualities in the midst of a highly-developed landscape full of traffic and noise. The opening of the corridor to passive recreation will not endanger these qualities, provided development is carefully planned. Chances are it will make them easier to preserve.

APPENDICES

A. Big Trees

Thanks to clearing associated with the channelization project, most of the trees in the corridor are less than fifty years old.

Using a clinometer and a tape measure, I recorded maximum heights and trunk diameters of the larger species (the results can be found in the "Specimens" field of the Species List). These trees were seldom even half as large as state record-holders documented in the MA Dept. of Environmental Management's annual, *Champion Trees of New England*.

For the record, only four trees in the survey exceeded either three feet in diameter or eighty feet in height—arbitrary cutoffs eliminating all examples of most species and and most individuals of the larger ones. Diameters were measured at five feet above the ground, and in cases where splits occurred below that height, only the largest trunk was measured.

The winners are:

White Oak Quercus alba 75 ft high, 4 ft 1 inch diam.

This isolated giant stands on the Dorchester bank just below the Central Avenue bridge, where it dominates a small triangle of unimproved bank about six feet below street level. Probably well over a century old, its spreading habit indicates it matured in an open situation, and only a handful of young ashes surround it today.

Red Oak Quercus rubra 82 ft high, 3 ft 4 inches diam.

This massive relic stands hidden in a small pocket of woods at the rear of the fill-platform on the Mattapan bank outside the northeast corner of the MBTA yard (behind the Riverside Apartments). It adjoins a remnant of an old puddingstone foundation probably belonging to a mill building that was here before the yard was expanded. The area is neglected and extensive heaps of household trash disfigure it.

White Pine Pinus strobus 85 feet high, 2 ft 7 inches diam.
82 feet high, 2 ft 9 inches diam.

These two tall, straight pines belong to a trio standing just north of the MBTA tracks about 200 feet east of Capen St. (Milton Meadow). The third member is actually the most massive (2 ft 11 inches diameter), but is slightly shorter (78 feet). This species is the tallest tree native to the Boston area, and can exceed 100 feet. Like other conifers, it is rare in the corridor, though many occur in adjoining neighborhoods. These seem to have survived, like the big oaks listed above, simply because no clearing, filling or other development happens to have occurred on their sites. The pines will no doubt be cut if they ever threaten to topple onto the MBTA tracks.

B. Notes on Wildlife

Although the scope of the survey did not include an assessment of wildlife in the corridor, I have a few anecdotal observations:

Mammals

Raccoon tracks were seen on several dates in snow around the MBTA bridge. Coons cross the river via the bridge and move up and down the riverbank underneath it on both sides.

Muskrats begin swimming around dusk in channels in the Marsh Islands section in the warmer months.

Bats use the river for drinking, dipping from it in midflight after sundown.

Chipmunks, gray squirrels, cottontails, and Norway rats were occasionally seen.

Active woodchuck burrows exist in several places on the fill-platforms.

Birds

Great blue and green herons fish along the river in late spring and other seasons.

Chattering kingfishers fly up and down the channel in summer. Dorchester birder Steve Donovan reports that they have nested in the gorge below Adams St.

Two or three pairs of Canada geese nested on the marsh islands in 1997. At least one pair fledged several young. In the cold months a group of two dozen or so would fly in late in the day to the open water below the islands (it never froze over).

Mallard ducks were frequently observed on the river, usually in pairs.

Baltimore orioles built a hanging nest in a cherry overhanging the channel at the east end of the Ryan Playground section.

Reptiles

A big snapping turtle basked in the marsh islands in early spring. Predators dug up and rifled three snapper nests atop the filled bank near the downstream end of Milton Meadow in June.

On January 4th, 1998, a small and hungry-looking garter snake appeared on the filled bank at Mattapan Terrace during unseasonably warm weather (60F). I had never before seen a snake in Massachusetts in January. This species also occurs in the old silo foundations in the Baker Dam section (Dorchester).

Amphibians

A bullfrog called from the area of floodplain woods and backwaters on the Milton bank below Central Avenue on May 16th. Another male was heard near Ryan Playground on June 19th. Bullfrogs are scarce in the corridor, and these individuals may have dispersed from upstream, where breeding occurs in a water-filled pit excavated for an unfinished chemical tank on the east bank just above the Patriot Paper dam in Hyde Park.

A single American toad called somewhere in the Ryan Playground area on June 19th (I heard it from across the river). The only possible breeding habitat in the survey for this species are some small pools below the embankment at the parking lot at the Playground. But the pools probably do not hold water for long enough in most

years, and no eggs were laid here in 1997. It may be that the calling male dispersed from somewhere across River St.

Fish

Big orange-finned carp approximately 18 inches long are common in the corridor, and can be seen shimmying alongside each other (spawning behavior?) in shallows at the head of the marsh islands in early summer. The carp occur upstream as far as the gravel bars below the MBTA bridge, where they ascend riffles noisily at dusk.

A small, deep-bodied fish about 4 inches long, apparently a sunfish, was seen lurking in the shady streambed just above the MBTA bridge on June 16th. On the same day, similarly-shaped fish about 1 inch long, perhaps juveniles of the same species, occurred upstream of the sharp bend below Blue Hill Avenue, where they hovered, facing upstream, in one and twos above flat rocks in fast-flowing shallows near the bank.

C. About the Species List

I recorded a total of 99 species of woody plants (trees, shrubs, and vines) growing without cultivation in the survey area in 1997.

The Species List arranges them alphabetically by family. Nomenclature follows *Gleason & Cronquist's Manual of the Vascular Plants of the Northeastern US and adjacent Canada* (1993).

Only species that resprout from year to year from woody aboveground stems are included.

Since approximately ninety percent of the survey area has a history of recent disturbance, it's not surprising that introduced and non-native plants are well represented: barberries, euonymus, buckthorns, boxelder, honeysuckles, catalpa, periwinkle, and so forth. In contrast, many natives common in less-disturbed habitats around Boston are absent: hemlock, scrub oak, pitch pine, swamp azalea, spicebush, chestnut oak, steeplebush, and others. Species of riverbanks and floodplains are fairly diverse, while those typical of more boggy and acidic wetland habitats are much scarcer.

Two trees—hackberry and river birch—are widespread in the corridor but rare overall in towns south of Boston. The birch may be a habitat specialist that competes well locally only in rocky or gravelly substrates annually inundated by large, high-energy streams—a scarce environment regionally. The hackberry is present both on the fill-platforms and the undisturbed ledges and I can't account for its prominence.

Though it is common in the south-central US, the only other place I have seen it in New England is along drier portions of stream bottoms in southwest Connecticut. If the Neponset population dates from precolonial times, it has adapted well to development.

Although many plants are rare in the survey, most are common elsewhere and none are on the US or Massachusetts endangered species lists. The only one that I could not recall seeing before was *Vitis riparia*, or Riverbank Grape, which occurred as a single example on the bank below Ryan Playground.

Is the list complete? I know of one tree that didn't make it—a smooth-barked hickory present high on the unfilled bank at the east end of the Ryan Playground section—I couldn't find any nuts and was unable to key it out. I should note, as well, that some of the catalpas I labeled *Catalpa speciosa* may belong to the similar species *C. bignoniodes*, and that there are several big, straight-trunked oaks just north of the high knolls at the southwest corner of Milton Meadow which seem to combine characters of red and scarlet oaks; I called them red (*Quercus rubra*) only because that species is more common locally. In short, the list is comprehensive, but no more perfect than its author.

D. List of Images

All images were shot on Kodachrome ASA 25 daylight transparency film with a tripod-mounted Pentax K-1000 35mm camera, and were processed by Kodalux (Fair Lawn)

1.	12/2/96	1893 view downstream from Central Avenue bridge (from job file #1531, Olmsted Historic Site, Brookline)
2.	1/1/97	Bend in by MBTA Mattapan Yard (Unquity House in rear)
3.	1/1/97	Bend in by MBTA Mattapan Yard (low angle/Unquity House in rear)
4.	1/1/97	Birch Conk/*Piptoporus betulinus*/Cliff Road
5.	1/18/97	Icy bank at MBTA yard, Mattapan, below RR bridge
6.	1/18/97	Icy bank at MBTA yard, Mattapan, below RR bridge (closeup)
7.	1/25/97	Floodplain below Central Avenue, Milton
8.	1/25/97	Moss and scats on abandoned RR bridge, Baker Mills
9.	1/25/97	Moss and scats on abandoned RR bridge, Baker Mills (vertical)
10.	1/25/97	Mills(Dorchester) and red maple reflected in river
11.	1/26/97	Trash dumped on riprapped bank nr Belnel Rd, Mattapan
12.	2/9/97	Head of marsh islands (Milton bank in rear)
13.	2/9/97	False Indigo *(Amorpha fruticosa)* at head of marsh islands
14.	2/9/97	Red Maple *(Acer rubrum)* on marsh islands
15.	2/9/97	Sunset over main channel, marsh islands (Valley Rd MBTA stop on left)

16.	2/12/97	Coon tracks in snow on MBTA bridge, Mattapan
17.	2/12/97	Coon tracks in snow under MBTA bridge, Mattapan
18.	2/12/97	Sycamore bole *(Platanus occidentalis)* at Mattapan Terrace
19.	2/12/97	Earth-covered riprap above MBTA bridge, Mattapan
20.	2/12/97	Channel above MBTA bridge, Milton/Mattapan
21.	2/23/97	Blue Hill Avenue bridge from Milton bank (downstream)
22.	2/23/97	Blue Hill Avenue bridge from Milton bank (vertical)
23.	3/2/97	Blue Hill Avenue bridge and Mattapan Square
24.	3/2/97	Entry archway, Baker Mills, Dorchester
25.	3/2/97	Milton bank above Baker Dam w/streetcar
26.	3/2/97	Graffiti on west side steam plant, Baker Mills, Dorchester
27.	3/2/97	Detail of old retaining wall below Central Avenue bridge, Dorchester
28.	3/2/97	Engine block buried in shelf bar below Central Avenue, Dorchester
29.	3/10/97	Red maples on terraced bank below Capen St., Milton (Milton Meadow)
30.	3/10/97	River Birch *(Betula nigra)* on marsh island
31.	3/10/97	Cobbles in riverbed, marsh islands
32.	3/30/97	Filled bank eroded by 10/96 sewage leak near head of Ryan Playground, Mattapan
33.	3/30/97	Field Garlic *(Allium vineale)* atop filled bank, Ryan Playground
34.	3/30/97	Sandbank burying shopping cart below MBTA bridge, Mattapan
35.	4/1/97	Snow-covered marsh islands, looking upstream
36.	4/1/97	49” diameter white oak *(Quercus alba)* below Central Avenue Bridge, Dorchester
37.	4/1/97	49” diameter white oak *(Quercus alba)* below Central Avenue Bridge, Dorchester (detail)
38.	4/1/97	Baker Mills from Dorchester bank (upstream)
39.	4/1/97	Steam plant and relict RR bridge, Baker Mills
40.	4/1/97	Snow on relict RR bridge, Baker Mills
41.	4/1/97	Icy backwater and snowy bank below Central Avenue, Milton
42.	4/11/97	Oak woods east of Capen St. (Milton Meadow)
43.	4/20/97	Nesting geese on marsh islands
44.	4/24/97	Mary Wynne w/red maple on filled bank, Milton Meadow
45.	4/97	Gray Birch *(Betula populifolia)* on bank, Milton Meadow
46.	4/97	Willow saplings in current, Milton Meadow
47.	5/3/97	Fenced bank below Cliff Road, Milton (Unquity House in rear)
48.	5/3/97	Fenced bank below Cliff Road, Milton (Mattapan Terrace in rear)
49.	5/97	Path on bank w/garlic mustard and apple, Ryan Woods
50.	5/12/97	Eroded natural bank below Cliff Road, Milton
51.	5/13/97	Filled bank and head of marsh islands, looking upstream (Milton Meadow)
52.	5/16/97	Snapping turtle *(Chelydra serpentina)* basking on marsh island
53.	5/16/97	Reed Canary Grass *(Phalaris arundinacea)* on marsh islands
54.	5/30/97	Milton end of relict RR bridge, Baker Mills
55.	5/31/97	Rear of MBTA yard (Mattapan Terrace)
56.	6/14/97	Marsh island attached to bank at Ryan Woods (Mattapan)

57.	6/20/97	Point bar at bend by MBTA yard, Mattapan Terrace
58.	6/20/97	Waterstained boulder below bank (Cliff Road)
59.	6/26/97	Black Willow *(Salix nigra)* on point bar below north end Capen St., Milton
60.	6/26/97	Riparian shrubs: Silky Dogwood *(Cornus amomum)* in bloom, False Indigo *(Amorpha fruticosa)* w/compound leaf. Ryan Woods area
61.	8/10/97	Marsh islands from Mattapan bank
62.	8/10/97	Marsh island w/purple loosestrife *(Lythrum salicaria)* and discarded tire
63.	8/10/97	Marsh islands from break in canopy, Ryan Woods
64.	8/10/97	Purple loosestrife *(Lythrum salicaria)* on bank, Ryan Woods
65.	8/30/97	Head of gravel bar w/young River Birch *(Betula nigra)* below MBTA bridge, Cliff Road
66.	8/30/97	Water-willow *(Decodon verticillatus)* in riffle below MBTA bridge
67.	8/30/97	Tire in riffle below MBTA bridge, Ryan Woods
68.	8/30/97	Head of gravel bar and MBTA bridge
69.	8/30/97	Gravel bar (Ryan Woods in rear)
70.	8/31/97	Dead elm *(Ulmus americana)* on bank, Ryan Woods
71.	9/1/97	Cobble bed exposed at low water, head of marsh islands
72.	9/1/97	Jewelweed *(Impatiens capensis)* and Pennsylvania Smartweed *(Polygonum pensylvanicum)*, Marsh Islands
73.	9/1/97	Bur-cucumber *(Sicyos angulatus)* blooming on False Indigo *(Amorpha fruticosa)*, Marsh Islands
74.	9/26/97	Cottonwood *(Populus deltoides)* on point bar, Mattapan Terrace
75.	9/26/97	Saplings downed by spring snow, Mattapan Terrace
76.	10/1/97	MBTA bridge from upstream, Mattapan Terrace/Cliff Road
77.	10/1/97	Riffle below MBTA bridge
78.	10/1/97	Meadowsweet *(Spirea latifolia)*, Ryan Woods
79.	10/3/97	New York Aster *(Aster novi-belgii)*, Marsh Islands
80.	10/3/97	Wild Cucumber *(Echinocystis lobata)* at channel edge, Ryan Woods
81.	10/3/97	Fill-platform brushed by BNAF volunteers, Ryan Woods
82.	10/11/97	Riverbend above Capen St., Cliff Road/Ryan Woods
83.	10/12/97	Mattapan bank below marsh islands
84.	10/12/97	Edge of marsh island w/purple loosestrife (Ryan Woods in rear)
85.	10/31/97	Old field on fill-platform, Milton Meadow
86.	10/31/97	Old tires below mudbank, Milton Meadow (Ryan Woods in rear)
87.	10/31/97	Oak woods w/streetcar, Milton Meadow
88.	11/5/97	Gray Birch *(Betula populifolia)* at base of bank, Ryan Woods
89.	11/30/97	Steam plant and Baker Dam from Milton bank