Stream Team Report 2009


Two Marlborough Stream Team photos, May 2009

- Broadmeadow Brook
- Hop Brook
- North East Marlborough Streams

Study Conducted April-May 2009

Submitted
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Introduction

This report includes three stream systems - Broad Meadow Brook, Hop Brook, and North East Marlborough Streams – all located in eastern Marlborough.

There are maps, photos and narratives written by Stream Team members who are Marlborough residents. This program was supervised by Priscilla Ryder, Marlborough Conservation Officer, with support from the Massachusetts Riverways / Adopt-A-Stream Program.

Getting Started: Training Residents
Training for 19 residents included an interactive slide show and a review of stream survey data collection sheets. Training was provided by Priscilla Ryder, Marlborough Conservation Officer, and Jennifer Boudrie, Stream Team Coordinator. At this meeting, the stream survey was divided into seven sections and seven Stream Teams.

Notifying Abutters
The conservation officer, Priscilla Ryder, mailed letters notifying residents and businesses abutting the stream to notify them that the stream team members would be out and invite them to participate.

Publicity
The local TV station reported on the Stream Team meetings and activities.

Maps and Documentation Detailed stream survey maps were provided to stream team members who were instructed to take notes and photos to document their work.

Survey Kits
Each team was provided with:

- Stream section maps
- A copy of the letter to abutters
- Shoreline Survey Field Data Sheets
- Orange Vests from the DPW

Field Work
Seven groups surveyed three stream systems in April and May 2009.

Follow Up Meeting
The Stream Team reconvened in a follow up meeting to report problems (debris/trash, pollution), resources (habitat, wetlands) and priorities (debris/trash, pollution) to the conservation officer.

Action
The list at the end of this report is a chart listing all the items that need attention. This list will be distributed to the appropriate people responsible for addressing the issue. This list will be updated every 6 months until all the items have been addressed.

Implementation
Two stream teams reported areas with significant pollution which were addressed by the Conservation Officer. In one case next to Rte. 20 near a restaurant where oil was seen in the stream, it was discovered that the restaurant was dumping its cooking grease along the edge of the brook. The Board of Health got

involved and stopped this activity. The second location where sudsy water was noted coming out of a pipe on Hanlon Dr. the DPW had discovered an illegal connection. They smoked out the pipe and hope to discover whose connection it is and will work with the Board of Health and Conservation Commission to require this to be disconnected.

Stream Teams and Map Sections

Broadmeadow Brook (north of Sudbury Reservoir)

Mike Manning (without a partner)
A13, B13, B15, C13, C15, D13-D15, E14 to Boston Post Road East

Kathleen Lirette, Jo-Ann Cote, Amanda Cote, Rachel Hooper, Melissa Brown, Michela Peltak
F13-F14 from Boston Post Road East, G14-G15, H14-H15

Hop Brook (Callahan State Park and north of it)

Gary Crossman and Susan Alatolo
E09-E10, E12-E-14, F10-F12, F14-F15, G10, G13-G15, H12-H15 to Boston Post Road East

Peggy Clark, Ginger Ryan, Ellen Dolan
H12-H15 from Boston Post Road East, I13-I15, J13, J15-J16, K13-K15, L13-L16, M13-M14

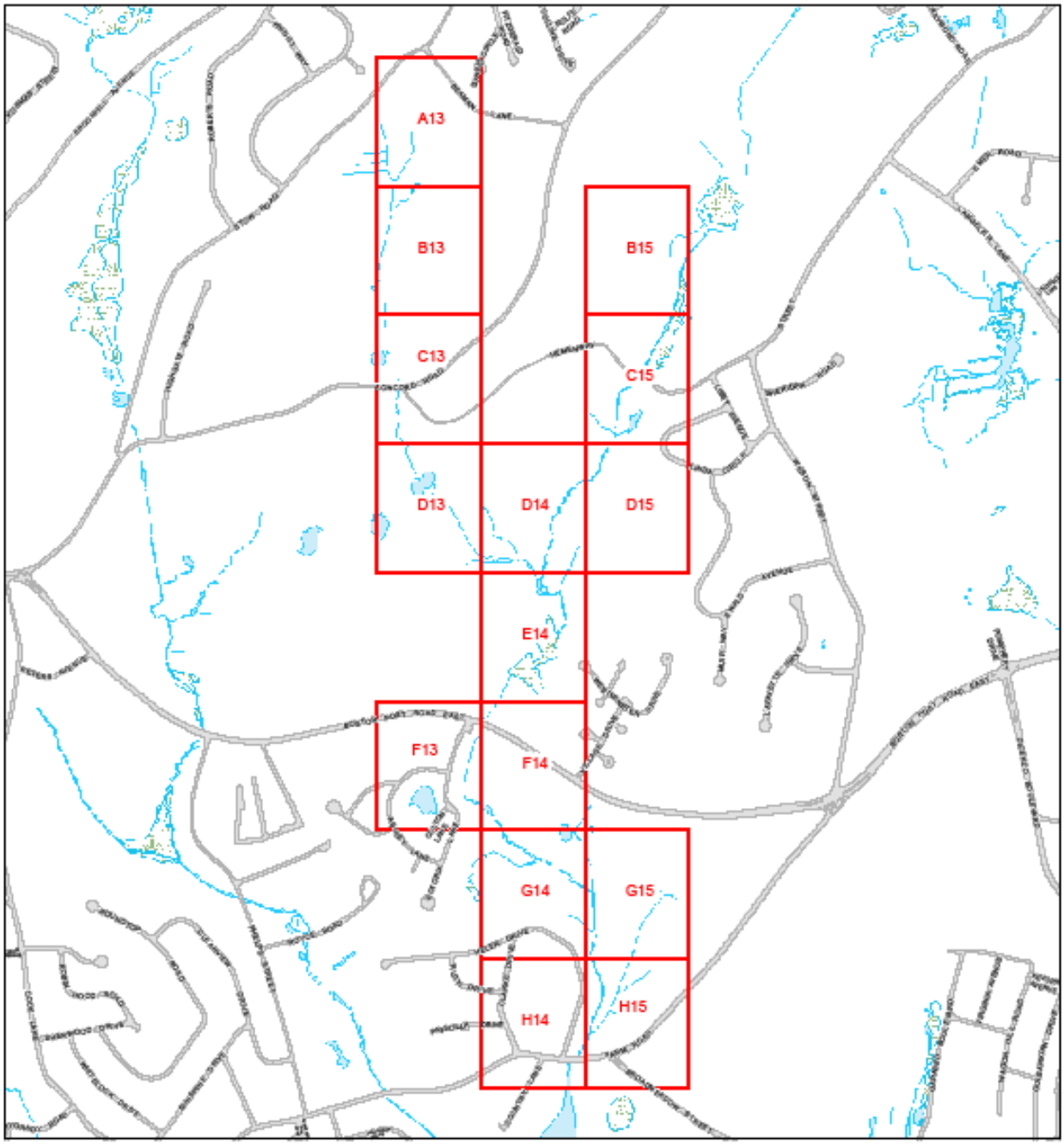
North East Marlborough Streams (near the Desert Conservation Land)

Melissa Kapeckas, Joan Lattke
B06, B08-B09, C04-C08, D06-D07

Frank Bennett, Bill (Liam) Tate
E06, E08, F05-F09, G08-G09, H08

Bob and Andrea Belford
E12-E13, F11-F12, G10-G12, H11-H12, I10-I11

Broadmeadow Brook Study



Broadmeadow Brook Study

Map segments	A13, B13, B15, C13, C15, D13, D14, D15, and E14.
Observer	**Mike Manning (with no team support)**
Date	Study conducted May 24 and 25, 2009 Narrative submitted but unfortunately no photos for this section.
Weather	52-62F, mostly sunny
Recent Weather	Mix of clouds and sun

Stream Description

Stream bottom	Sand
Water	Tea colored, less than one inch
Flow	Almost still
Gradient, sinuosity	Straight, riffles/runs, meandering

Habitat

Large woody material	Moderate
Small organic material	Abundant
Undercut banks	Moderate
Overhanging vegetation	Abundant
Aquatic vegetation	Moderate
Algae	No

Human alterations Lots of litter**, c**ulverts, roads

Riparian area and land use

Bank stability	Intact
Bank cover	Shrubs, forests, 500 foot wooded banks
Land use:	Undeveloped, unprotected land, wooded areas, residential, golf course

Recreation

No

Aquatic/Animal species

No Fish
Frogs
Herons
Animal tracks

Riparian habitat/species

Habitat elements	Fallen tree limbs and trunks, vernal pools, wetlands adjacent to streams

Narrative

Grid section B15: The survey started at the end of the paved section of Hemenway Street near Linda Circle. There is a walking trail here which actually begins in Grid Section C15. To the immediate north of the walking trail is Grid section B15. This area is a very heavily vegetated area with overgrown banks. The area, overall, is very swampy and the flow of the Brook is somewhat stagnant. Walkers and dog walkers frequent the walking trail. There was some minor trash scattered near the residences and some deliberate dumping near the brook. The deliberate dumping included an automobile front seat, an automobile hood, automobiles tires, and some steel pipes. From the look of the items, most had been dumped many years ago. These were all collected and brought out to the end of Hemenway Street. The City of Marlborough DPW was contacted and the items were removed.

Grid section C15. The walking trail begins in the center of Grid section C15. The brook flows south from Grid section B15 under the walking trail via a large stone culvert. At this culvert, the brook is very visible compared to Grid section C15. On the southern portion of the culvert, the brook is slow moving with little or no gradient. The brook bottom is sandy and the brook itself is tea-colored and has no odor. At the stone culvert, a 12" diameter corrugated plastic drain pipe feeds storm drain water from Hemenway Street and Linda Circle directly into the brook. At this point, the brook begins a meandering pattern. The brook depth is 2-3 inches deep and is approximately 36 inches wide.

Approximately, 300 feet south of the culvert are a number of submerged tires. These were not removed at the time of the survey. The flow of the brook at this point is moving more rapidly – but is still rather slow. The bottom is still sandy. At the southern portion of Grid section C15, the brook divides into two (2) branches. One branch flows in a westward direction. The second branch flows in an eastward direction and empties into a large pond near the rear of the residences of Linda Circle.

Grid section D15. The brook, now back to a singular main flow, flows southwestward towards Grid section D14. In this section, the water flows slowly due to near zero gradient. This is a very heavily wooded area in all directions – with the only access from Linda Circle through private properties. The banks of the brook are overgrown with trees and vegetation.

Grid section D14. The area was very heavily wooded and difficult to traverse. The brook flows in a more southward direction. The brook flows fairly quickly as it approaches Grid section E14.

Grid section E14. As the brook flows southward, it takes a 90 degree eastward turn. After a few hundred feet, the brook makes another 90 degree turn – this time – directly south. The brook flows for a few hundred feet before ending in a large swampy area to the rear of the businesses located on Westminster Drive. Here, the brook flow is very stagnant and almost still.

Grid section A13. In Grid section A13, the portion of the brook begins to the immediate south of Stow Road near the intersection with Beaman Lane. This area is heavily wooded and the brook is difficult to locate. The brook, at this point, is actually two (2) flows in the shape of a "Y" which flow in a southward direction and then join in a single southern flow at the very southern edge of Grid section A13.

Grid section B13. In Grid section B13, the brook continues a slow flow in a southern direction and enters the Marlboro Country Club property. The area surrounding the brook, prior to the Country Club property line, continues to be very heavily wooded. Once on the Club property, the brook flows in vary long underground corrugated steel culverts with no access.

Grid section C13. In Grid section C13, most of the brook flows in culverts under the greens of the Marlboro Country Club. The brook reappears from a stone culvert. The flow is moderate here as the brook approaches Concord Road. The bottom is sandy and the brook banks are grassy. At this point, the brook has moderate flow, is tea-colored, and has no odor. Approximately 50 feet south of the stone culvert, the brook passes under Concord Road via a 36" diameter corrugated steel culvert. The culvert is in very good condition with no obvious defects. On the southern side of Concord Road, the culvert emerges and the brook flows down a small waterfall. The drop in elevation is only 1-2 feet but this allows the brook to flow more rapidly. At this point, the brook flows in a southward direction in a very heavily wooded area. The brook bottom is very sandy and the brook itself remains tea-colored. The banks are covered in vegetation.

Grid section D13. In Grid section D13, the brook begins a more southeastern flow and empties into a large pond. At the southern edge of the pond, the brook resumes flow and continues in a southeasterly direction. The brook continues this flow into Grid section D14 and flows towards the other main branch of the Broadmeadow Brook and then combine into one singular flow in Grid section E14.

Problems

C-15 12-inch diameter plastic drain runoff comes from Hemenway Street and Linda Circle
F-14 Slight concern about run-off from parking lots
A-13 Slight concern about run-off from Stow Road
C-13 Concern about run-off from Concord Road and the golf course

Assets

B-15 Isolated segment with very heavy vegetation and little or no access
C-15 Excellent walking trail w posting on a trail guide kiosk
D-13 Pond

Priorities

C-15 Trash and debris was removed from area near brook. DPW removed all items.

Map segments	F13, F14, G14, G15, H14, H15
Date	Study conducted 4/11/09 and 5/3/09
Observers	**Kathleen Lirette, Jo-Ann Cote, Amanda Cote, Rachel Hooper, Melissa Brown, Michela Peltak**
Weather	April 11, 2009, 40's F and rainy May 3, 2009, overcast in the 50's F
Recent weather	April 11, 2009, sunny in the 50's F

Stream description

Stream bottom	Silt/sandy to gravel/cobbles to some areas of rocks
Water	Clear to tea colored, approximately .5 - 1.5 foot deep
Flow	Stagnant to moderate flow
Gradient, sinuosity	Mostly low and meandering

Habitat

Large woody material	Abundant
Small organic material	Moderate
Undercut banks	Sparse
Overhanging vegetation	Abundant
Aquatic vegetation	Abundant
Algae	Coating rocks throughout stream

Human alterations

Oily sheen throughout
Some litter/grass clippings
Culverts
Homes are close to the stream (H14/H15); possible run off here; household materials close to stream

Riparian area and land use

Bank stability	Defined banks in most areas, undercut banks visible as well
Bank cover	Banks were similar, surrounded by wooded areas (trees/shrubs) and wetlands. In the residential area behind Helen Drive, houses were very close to the stream with yard materials sometimes over the stream or right on the stream.
Land use	Commercial, Residential, Parking lots and roads. The rest was wooded forest and wetlands.
Recreation	No recreation
Aquatic species	No evidence of aquatic species

Riparian habitat/species

Evidence of animals	Two different types of footprints seen near the stream
Habitat elements	Scattered rocks and boulders, stone walls, vernal pool, wetlands adjacent to stream
Birds	Ducks

Narrative
Throughout our survey the stream was in good condition. The water was clear to tea colored with stagnant to moderate flow. The area surrounding the stream was made up of wetland/woodlands to residential. A lot of vegetation (fern, shrubs, trees) and wetlands surrounded the stream. There was a section from Jo-Len Mobile Home Park to behind Jordan Stables (F14) that was completely impassable due to overgrowth of shrubs. There was no observed evidence of manure piles close to the wetlands at Jordan Stables. Where the stream ran behind homes on Helen Drive there were some pipes coming from the properties draining into the stream and a lot of yard materials over and near the stream (grass clippings/yard debris/siding). All of the culverts along the stream were in good shape with the exception of one at Farm Road that was broken and corroding.

Problems

Trash in the stream at the beginning of our survey by Jo-Len Park. Neighbors concerned coming from Dunkin Doughnuts. We spoke with a business neighbor and she said that the Jo-Len association and local business owners do periodic cleanups of the banks of the stream but still remain concerned about the trash coming from Dunkin Doughnuts.

Behind Jordan Sables the property manager was concerned about drainage issues on the property. The DPW was recently there and was working on some drainage piping.

Oily residue observed throughout our survey from start to finish. There was not an odor of oil present. Helen Drive resident was concerned about people damming up the steam to gather crayfish.

Behind Helen Drive there was another stream that was very stagnant and smelly and looked quite polluted. It was nasty. It came from the sewer easement and met up with the main stream. The banks were very mucky and surrounded by poison ivy.

Assets
This area provides a wooded habitat for wildlife.

Priorities
Oily Sheen
Trash at Jo-Len Park
Property management along stream at Helen Drive
Large amount of green aquatic vegetation
Culvert at H14 as it crosses Farm Road. Pipe is corroding on the bottom

First Day April 11, 2009

Start of Stream; pipe 18” diameter under bridge 61” opening across

At start of stream Jo-Len Trailer park to the right. Pipes in water

Trash in water behind Jo-Len

Oil spot

G14-at sewer easement…under the easement

Pipe area behind 73-27 pond...DPW was opening this area up about 2 weeks ago

Second Day – May 3, 2009

Looking down from top of easement

Other side of easement - Nice flow

Lots of vegetation

Vegetation in water – Algae?

Vegetation on boot – Algae?

Right bank undercut - View downstream

Oily sheen in water

Good view of stream

Oily material

View of banks

Animal tracks

Animal tracks

Trash

Behind Helen Drive

More behind Helen Drive

Habitat possibility?

Grass clippings

More behind Helen Drive

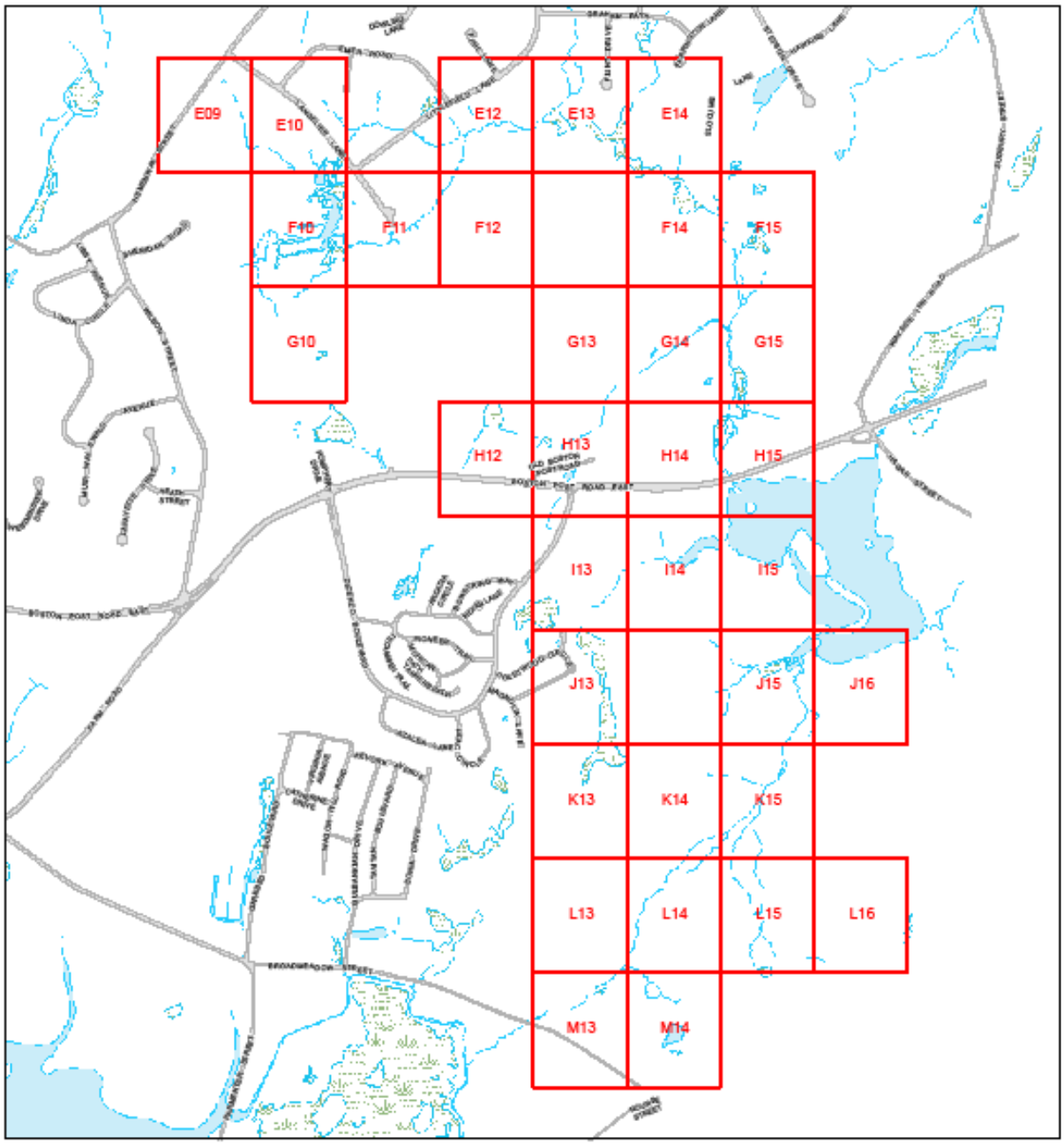
More oil in the water

View of stream

Corroding

Other side of Farm Road. Oil still evident in water

Hop Brook Stream Study



Hop Brook Study

Map Segments	E09-14, F10-15, G10, G13, G14, G15, H12-15
Date	April 19, 2009 2:15-5:30 p.m.
Observers	**Gary Crossman and Susan Alatalo**
Weather	Around 58 degrees and sunny
Recent Weather	Rain in past few days

Stream Description

Stream bottom	Usually muddy, some organic debris and gravel. Sometimes bottom is rust colored.
Water	Variety of colors, sometimes tea colored, sometimes opaque brown or slimy green or rusty orange or brown milky; 1 inch to 2 feet deep
Flow	Usually moderately rapid or just a trickle
Gradient	Steep in numerous spots
Sinuosity	Usually meandering
Reach	Characterized by some riffles and pools
Stream flow	Blocked by trees, boulders, trash.

Habitat

Large woody material	Abundant
Small organic material	Usually moderate
Undercut banks	Moderate
Overhanging vegetation	Usually moderate
Aquatic vegetation	Sparse
Algae	Occasionally near pipes

Human alterations

Litter and pollution made the water odorous, oily, milky, slimy or orange
Culverts
Possible run-off from lawns/road although limited by sisal netting in stream bed and distance from stream

Riparian area and land use

Bank stability	Eroded or channelized in just a few areas.
Bank cover	Banks were adjacent to busy roads, parking areas, storage containers, commercial businesses as well as by woods with tall trees, many vines, bushes and logs. In residential areas, houses with lawns were 50-200 yards away.
Land use	Commercial, some municipal, recycling, some residential, roads, wooded areas and wetlands

Recreation

Access to Hager Pond is augmented by benches and gazebo. Most spots had no easy access to water.

Aquatic species Minnows in Hager Pond

Riparian habitat/species

There is much skunk cabbage, vines, hardwood trees, fallen tree limbs, scattered rocks, springs, some cattails and standing dead trees. In **Hager Pond** were swans, seagulls, ducks, and snow geese. Also sighted a purple finch and heard spring peepers in the residential section of **E11** and **E13.**

Narrative
Conditions varied throughout the assigned areas. The stream seemed to be in good condition in the sparsely populated residential neighborhoods, but in poor condition near the commercial sites and **Boston Post Road**. The water had moderate flow in many spots but sometimes it disappeared or became a small pond. The natural habitat surrounding the stream is made up of wetland and woodlands. Skunk cabbage was pushing up throughout the area, which was surrounded by hardwood trees, vines, and a little moss.

Problems
Dark rusty water comes out of a 24" diameter steel pipe behind the tall, solid white fence at the rear of the **Hess Gas Station** on **Boston Post Road**, next to **Marlborough Nissan**, in **H12**.The water is moving in a northeasterly direction. Here oil slicks are re-joining after poking.

In **H13** between **Halfway Café** and **Kane Storage** and between **Boston Post East** and **Old Boston Post Road** is a small 20 foot long pond of brown milky water (see Photos). Thick greenish algae is shown in on H13 photo. Much trash has been dumped here, even a metal one way sign, apparently knocked down from the **Dicenzo Boulevard** entrance, complete with post. A dead muskrat is next to the road, just inside the guard rail and a decomposing animal is below in the water. The water flows northerly.

On the other side of **Boston Post Road,** along the perpendicular **DiCenzo Boulevard** in **H13** near **I13,** the water flow disappears before going under Route 20, but before it does it is a very nasty orange, rusty color (see Photos). It is gunky and oil-looking with blackened oak leaves on the bottom. Further away from Route 20, closer to **I13,** sisal netting/ jute matting has been pegged along the steeply sloping brook where the water is orange (see Photos). Trash bags, planters, beer cans, styrofoam cups, a pipe section and automotive body parts are scattered in the rosethorns and long grasses. Next to the steep embankment between the brook and **Dicenzo Boulevard** is a stand of pines and landscaped lawns with pesticide warning signs. Down in the ravine is an 18" pipe filled in with branches, skunk cabbage, and trash.

Along the driveway to **Easterly Water Pollution Control Facility** in **G13** the rapidly flowing water becomes dirty and rusty riffles (see Photos). Closer to the entrance of the **Easterly Water Pollution Control Facility** are 7 bags filled with trash, 3 tires, an air conditioner, adult entertainment advertisements, and a bleach bottle along the moderately rapidly flowing orange water which (See Photos)

The water in **Hager Pond** in **H15** is odorous as it quickly flows out of an opening 4' x 3' deep with 1' opening from water surface to top of pipe. Sudsy, brown matter is emitted. There is much litter along the banks on both sides of Boston Post Road. The odor is also strong from the water on the other side of the **Boston Post Road,** where there is a log jam and scuzzy algae. Banks have some green moss. There is a 4' wide pipe opening the same as the other side.

There is trash alongside and in the water in **H10** next to the storage units. Green slime is in the water.

Assets
Green space is a good buffer zone and provides a wooded habitat for wildlife.

Priorities
Pinpoint pollution sources. Address litter.

H12 Rusty, oily water coming from 1 foot pipe

H12 Rusty, oily water coming from 1 foot pipe

I13 Sisal netting. Trash in this area

I13 Sisal netting

I13 Oily water near sisal netting

I13 Sisal netting

H13 Brown milky polluted waters

H13 Polluted waters

H13 Thick green algae

H13 Thick green algae #0971

H13 Pollution

H13 Pollution

G13 Trash

G13 Abandoned trash

G13 Trash along roadway

G13 Rusty colored riffles

G13 Rusty colored riffles

Map Segments Hop Brook Sections: M13-L14, K15 – J16
Date April 5, 2009
Observers **Peggy Clark, Ellen Dolan, Ginger Ryan**
Weather Sunny, clear, high 50's

Stream Description

Stream bottom:	Sandy, small rock bottom
Water:	Clear, clean, no oil residue, mossy in certain areas
Flow:	Slow moving for the most part; one segment only fast flowing
Gradient:	Mostly level except one steeper gradient where the area was fast flowing
Sinuosity:	Swampy in many areas – one area of distinct stream with almost no banking
Reach:	Mostly still, one area distinct ripples

Habitat Swampy, woodsy, hiking/walking trails

Human Alterations Walking, hiking, biking trails

Riparian Area and Land Use Marshy wetlands, woodland

Recreation Walking trails

Wildlife Deer scat, evidence of beaver activity, garter snake, Birds

Wildlife Habitat Wetland areas with thick vegetation. Bushes, large trees

Narrative

HOP BROOK STREAM
BEGAN M13-L14
ENDS AT K15-J16 (NEAR HAGER POND)

On a clear Sunday, April 5, 2009, Peggy Clark, Ellen Dolan and Ginger Ryan walked the Hop Brook Stream through Callahan State Park, off Broadmeadow Road in Marlborough. Skies were sunny and clear, and the temperature that afternoon was in the high 50's. Weather was dry and had been for many days.

We parked in the car lot at the end of Broadmeadow Road, shortly beyond Gullbankien's Mobile Home Park. This is the beginning for two hiking/biking trails through this northern section of Callahan State Park. There were seven other cars parked there, so many others were out enjoying this beautiful wooded area.

Just north of the parking area, we entered a broad stretch of marshland on the east side of the road. This area had a lot of newly sprouted skunk cabbage and moss. This area as well as the area we would next enter are actually outside the boundaries of our assigned stream zone. This area was too marshy to walk through so we followed this stream west, back under Broadmeadow Road through a culvert. We hoped to follow this to connect to the Hop Brook Stream section that was part of our assigned territory of the map. The roughly 18 inch-culvert was made of stones cemented in place, and was in good condition. There was evidence of erosion from the road and there were sandbags to restrain the flow of the dirt. There was only a small amount of trash on either side of the culvert; however, on the east side, there appeared to be a discarded air conditioner.

Culvert on west side of Broadmeadow Road just north of the parking area. (M13)

Sandbags adjacent to above culvert (M13)

We followed the stream on the west side determining from our map that it would soon branch, and that the branch on the left would turn eastward and again cross Broadmeadow Road. The area at the beginning was marshy.

Later, the stream became more distinct, moving slowly and was about 1 ½ feet deep with a leafy sediment on the bottom.

The area around the stream was woodsy. Walking farther, we then noticed what appeared to have been an old beaver dam.

Boggy Stream Area (near M13)

Evidence of beaver activity - (near M13)

deer (scat) was through this area. Of interest to us were many granite/concrete post bases along the stream; perhaps former markings or a fence system.

Granite/Concrete Marker – woods to the west of Broadmeadow Road, near M13

We continued to where the stream branched – the right branch of the stream more obvious as it headed westerly. The left branch, the one we were to follow, became marshy and we could not pass through. We realized that Broadmeadow Road, now a dirt road, had continued past where we had parked and that if we walked directly east through the trees, we would re-connect. Happily, we heard the sound of a truck and were able to follow the sound and re-emerge back on the road about a 100 or so yards south of the parking area. This area was quite a bit higher than the parking area. We crested the hill and continued walking south down the other side when we saw the stream on our left (east). This area is part of some of the walking/biking trails of Callahan State Park.

There was no sign of a culvert from the marshy area on the west allowing the water to reach the stream on the eastside. It appears as if the water may pass through underground. Since we were not able to follow the stream at this point (again marshy), a hiker told us to follow the walking path and that we would see a branch off to the right which would bring us back to the stream. Therefore, we followed "Acorn Path" and soon we reached the fork which would take us to the stream. Along the way, we passed a garter snake.

The path at this point went slightly downhill to where it crossed the stream. The water was flowing down as it moved eastward, causing a little waterfall. The water was clear and cold with a sandy bottom; not much organic material. In general, the stream was shallow, interspersed occasionally with areas of deep pools. There were many rocks around the sides of the stream. The area here was still very wooded.

Sandy bottom of stream (L14)

Fast Flowing – lots of moss (L14 –K15)

(L14 –K15) Clean, clear water

Flat Stream area (K15)

Continuing on, the topography became level again. A well-preserved stone wall parallels the stream, about 50 yards or so to the north side. As we followed the stream, it narrowed to about two feet wide as it flowed along a more even gradient, even though the land north of the stream became hilly. The area to the south of the stream became marshy once again and soon the stream disappeared into the marsh.

We made our way back to the hiking trail (just a little north of the stream) hoping to follow the stream to where it entered Hager Pond. At this point, there were some large structures just beyond the path, and we realized we were adjacent to the Raytheon Property. Since there were many "No Trespassing" signs, we were forced to end and return along the walking trail to the parking lot.

No trespassing sign just before Raytheon property
(note hilly area) (J15)

Raytheon sits on the pond. We guessed we were but a short distance from Hager Pond when we turned back and followed a different trail back. This trail "backpackers" brought us up the hilly area noted before and then down and into the parking lot from the woods.

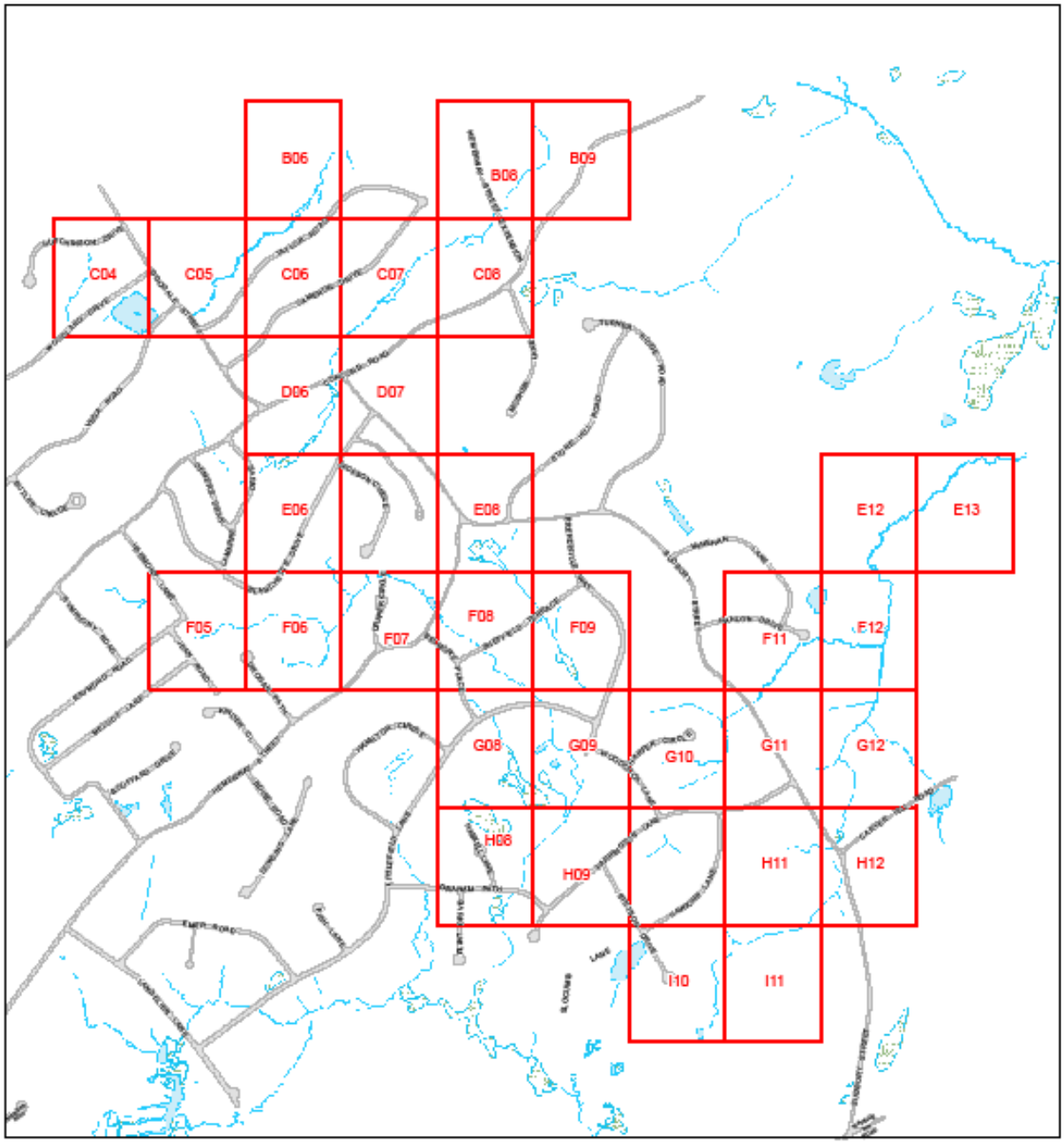
The entire wooded hiking biking area was in very good condition. Obviously, the people using this area take great care and maintain its pristine quality since there were no signs of trash or damage done by hikers, etc. We passed many people walking with their dogs. In general, the trails, stream and woods looked undisturbed, even though they are part of an active recreational area.

Problems Check erosion (culvert near sandbags) M13

Assets Well maintained trails/paths throughout Callahan State Park
No trash
Nothing blocking streams

Priorities None
Conditions appeared excellent from M13- J16

NE Marlborough Stream Study



Northeast Marlborough Stream Study

Map Segments	B06, B08, B09, C04, C05, C06, C07, C08, D06, D07
Date	April 5, 2009
Observers	**Melissa Kapeckas and Joan Lattke**
Weather	Around 58 degrees and sunny
Recent Weather	Rain in past few days

Stream Description

Stream bottom	Silt, organic debris (most frequent) to gravel and small stretch of cobbles
Water	Tea colored, 0.5-2 feet deep
Flow	Mostly slight
Gradient, sinuosity	Mostly low and meandering

Habitat

Large woody material	Abundant
Small organic material	Abundant
Undercut banks	Sparse
Overhanging vegetation	Abundant
Aquatic vegetation	Sparse
Algae	Near pipes at C04 pond off of Woodland Drive

Human alterations

Some litter
Culverts
Possible run-off from lawns/road although limited by hay bales by roadways and distance of houses from stream.

Riparian area and land use

Bank stability	Defined banks in most areas, undercut banks in C08 by Hemenway St. Extension
Bank cover	Banks were similar, surrounded by wooded areas and wetlands on both sides. While it was a residential area, houses varied from being 20-50 yards away.
Land use:	Residential, roads, conservation land. The rest was wooded forest and wetlands.

Recreation

No direct access to the stream or pond.

Aquatic species

Fish	Unknown, some small fish visible in C04 pond
Other species	Frogs, aquatic insects

Riparian habitat/species

Habitat elements	Hardwood forest, wetlands adjacent to stream
Birds	Blue jay, robin, woodpeckers, crows

Narrative

Throughout this region, the stream seemed to be in good condition. The water was clear with moderate flow. The habitat surrounding the stream was made up of wetland and woodlands. Skunk cabbage was pushing up throughout the area, which was surrounded by hardwood trees, vines, and some moss. While this stream flows through a residential area, it is a quiet neighborhood with houses spaced apart from one another and the stream. The houses varied from 20-50 yards from the stream. Hay bales by roadways seemed to control erosion and would also help block runoff. The only possible problems relate to the condition of some of the culverts in the area. The mortar surrounding the rocks that encase the pipes are starting to crack, risking collapse. One culvert pipe was crushed on both sides.

Problems
The culverts (listed below) have potential problems that need to be addressed:

- C05 culvert near Goodale St.- rocks above pipe are cracking.
- B08 near Hemenway St. Extension- pipe is rotting out; base of culvert is broken off
- D06 culvert by Sudbury St.- rocks are shifting.
- Drainage ditch by Concord Rd./Sudbury St. intersection. When the water level drops in the summer, is this a problem?

Assets
This area provides a wooded habitat for wildlife.

Priorities
Assess culverts for damage.

#1 Woodland Drive

#2 C4 Woodland Dr Culvert Draining into Pond

#3 C4 Woodland Dr area Stream from the Drain

#4 C4 Mossy rock w leaves stream 50yds from St

#5 C5 Four culverts

#6 Cracked culvert. Close up of #5 culvert

#7 C5 Stream downstream

#8 Concord Road culvert

#9 C5? Concord Rd Culvert, rocks ready to fall

#10 Corner of Sudbury and Concord Drain Drip
About 1 foot diameter on someone's property
About 30 feet from the #8 photo

#11 Culvert on the south side of Concord Street

#12 Hemenway Street Ext. Culvert NW

#13 Hemenway Ext Broken SE culvert

#14 B8 Culvert busted left side Hemenway Ext.

#15 Eroded bank

#16 B8 Eroded bank - undercut

NE Marlborough Stream Study - Unnamed Stream # 1
GPS Map Sections E06, F05, F06, F07, F08, G09

(*Note: each colored section of the walking stick shown in any of the photos, is 1 foot)

Map Segments : E06, F05, F06, F07, F08, G09
Date(s): April 8 and 13, 2009
Observers: Frank Bennett and Bill Tate
Weather: cloudy, some sun, 45 - 50 degrees F
Recent Weather : had rained for several days prior to our visits

Stream Description:

Stream bottom: usually hard packed sand, some muddy areas, stones/rocks prevalent too.
Water : usually clear, 3 inches to 1.5 ft deep, Water level seemed normal.
Flow: generally slow moving with some areas of rippled flow
Gradient: slight
Sinuosity: mostly meandering .... one short stretch channelized
Stream Width: 2 - 6 feet
Reach: abundant vegetation: trees, bushes, low plants (abundance of skunk cabbage)

Habitat:

Small woody and organic material, usually small low banks on both sides of the stream.

Human Alterations:

The area is abutted by a large housing development.... numerous examples of yard waste (grass clippings, leaves, tree branches) build-up at edge of woods and wetlands.

Riparian Area and Land Use:

As mentioned, the area is surrounded by a large housing development. Most of the area on the stream banks is wooded, with trees about 20 - 150 feet on either side.
Visible land uses include large houses, well kept yards and lawns, wetlands and wooded areas.

Recreation (None)

Wildlife:

Although actually not seeing any, did hear birds chirping..

Wildlife Habitat:

Trees, standing & fallen dead trees and limbs, stream banks, swampy areas, some grasslands.

ASSETS:

naturally beautiful area

PROBLEMS:

Some debris buildup in pipes and culverts
Some litter, especially near culverts running beneath streets

PRIORITIES:

Unclog culverts in following sections:

- GPS MAP Sect. F06 off of Grogan Path (front corner of properties 22-107 and 22-108)
- GPS Map Sect. F05 off of Jean Road (between property lines 22-28 and 22-38)
- GPS Map Sect. E06 Blanchette Drive (property 22-91 and across the street 22-89)
- GPS Map Sect. F07 (3 culverts beneath land bridge at end of Draper Circle)
- GPS Map Sect. F07 (grated culvert at end of pond next to Hemenway Street).
- GPS Map Sect F08 double-culvert beneath Sheffield Terrace (prop. 22-68 and 22-76)
- GPS Map Sect G09 (double culvert-left side..beneath Littlefield Lane (property 23-84)

Revise GPS Maps to show culvert openings and substantial stream (not currently shown):

- GPS Map Sect F05 off of Jean Road (between property lines 22-28 and 22-38)
- GPS Map Sect.G09 50 feet straight in from the end of Prendiville Way where it meets Woodcock Lane

NE Marlborough Stream Study - Unnamed Stream # 1
GPS Map Sections E06, F05, F06, F07, F08, G09

We began our trek a dozen yards into the woods at the very end of Raymond Road where it forms a right angle with Harmony Lane (GPS Map Sect. F05). Here we found two unclogged culverts 3 feet in diameter. The trickle of water flowing from the culverts was quite clear, and turned into what was to be the "main" stream that meandered its way in a northeasterly direction for almost a mile (c. 5000 ft. - 1.5 km.) until it emptied into a culvert that flowed below Woodcock Lane (GPS Map Sect. G09).

Just a few yards from the culverts and past an uprooted tree, the stream began to widen (c. 3 - 4 ft) and was characterized by a sandy bottom with occasional small stone. There was some evidence of erosion on the stream banks, which in general were about 1 ft high on each side. The stream was several inches deep and quite easy to walk through.

A few hundred feet further along the "main" stream we began to notice bright green moss growing on the streams' bankings, a sight which was to become quite frequent. Skunk cabbage was also quite abundant in the swampy areas off to the side areas of the stream. The stream bottom also continued to be quite sandy.

It was about at this point we noticed a tributary entering from the right side and we decided to follow it "upstream" to its source. This tributary is <u>not indicated</u> on GPS Map Sect F05. The tributary led us to two flared culverts located a dozen yards off of Jean Road, at a point where Melody Lane meets it. These culverts were 1 ft wide at the base and 1.5 ft high and although somewhat clogged with leaves, allowed water to pass through from a stagnant pool nearby it. These culverts were also <u>not indicated on our GPS Map</u> (Sect. F05). Here we also found a small pile of deer scat.

We followed the tributary back to the "main stream" and walked further along continuing to notice the quite sandy stream bottom and the swampy / wetland areas on each side of it. The "main stream" had also widened to 5 or 6 ft, but remained quite shallow (only several inches in most places). GPS Map (Sect. F06)

We continued on downstream looking for another tributary entering from the right and shown on our GPS map (Sect. F06). While investigating a swampy area off to the side of the stream, we noticed a rather "wet looking path" coming down a small incline, which in turn did indeed lead to two culverts located just off of Grogan Path. One culvert on the left was quite clogged, but with water making its way through. It measured 14 in. across. The larger, clogged, flared culvert on the right measured 2.5 ft. tall, and c.3 ft. wide at the base. The "wet path" actually led down to a wet and swampy area which rested to the right of the main stream.

The main stream at this point (GPS Map Sect. F07) narrowed slightly, but became a little deeper (6 - 8 in.) . It was about here that we found another tributary entering the main- stream. We followed it up to a culvert located on Blanchette Drive (GPS Map Sect E06)

We followed the tributary back to the main stream and walked another 50 ft. or so to a large culvert which passed beneath a land bridge at the end of Draper Circle (GPS Map F07).

It was at this point we met a fellow who lived on Draper Circle who came out to see what we were doing. He related to us that in the few years he had lived there he had seen deer, coyote, fox, duck, possum, raccoon, and hawks in the neighborhood. He also related how he and two neighbors had also come down with lime disease in varying degrees of seriousness, in the past three years.

We finished our conversation and walked through the culvert to the other side and continued downstream. The stream was about 6 in. deep now and there seemed to be a muddier bottom to it with larger stones along the way. About 100 feet further downstream we came to a large land bridge where the stream apparently stopped flowing, and yet there was no pool or pond created to indicate such. With a little poking around Frank found / heard a slight gurgling sound, indicating that the stream was somehow passing through the boulder based bottom of the land bridge.

We climbed up and over the land bridge and on the other side the bolder base was clearly more visible. Again on this side, the sounds of any gurgling were slight, but it was clearly evident that stream flowed quite nicely through this seemingly solid barrier.

We continued downstream where the water flow picked up slightly, with the stream width being 3 -5 ft across. The stream bottom was a bit rockier in many places and definitely more difficult to walk in. The depth was about 6 - 10 inches. At one stretch, shortly after the land bridge there was evidence of erosion on the left bank, which was about 5 ft high at its highest point. 100 feet further downstream the stream flow lessened a bit and the land area leveled off.

The mainstream continued for about another 100 feet where it then emptied into a large pond estimated to be about 80 -100 ft long and 50 - 60 ft wide. We could not find any signs of aquatic life in the few minutes that we stayed there. It must be a place of interest or serenity for someone local however, as two rather large stone benches had been created on one of the bankings obviously with the intent of enjoying the scene. The pond emptied into a quite large and well clogged culvert at the edge of Hemmenway St.

The 7 - 8 ft. wide culvert opening was covered by an iron grating, which in turn was almost totally blanketed by leaves, sticks and twigs. Water only passed noticeably through it to the far left, at which point the water dropped about 3 ft. into the culvert, which in turn passed beneath Hemenway St. The 3 ft high culvert opened cleanly on the other side into a man made channelized portion of the stream. We're assuming the owners of the property also built the wooden bridge over the stream. The water was clear, a bit more fast flowing, and about 6 - 10 inches deep at various points. Walking in the stream was more difficult because of the boulder strewn bottom. The stream's width varied between 4 - 6 ft

About 75 ft. past the bridge, the bankings leveled out and the stream's width stayed at about 6 ft. Walking was also easier once past the channel. Water was clear and the depth was c. 4 - 8 in. The stream continued for another 100 ft. and brought us to a double culvert at Sheffield Terrace. Each culvert was c. 5 ft. wide and 3 ft. tall. Water cleanly flowed through the right side, and also through the left, however this side did have some accumulation of sand, mud, and debris inside.

Continuing on the other side of Sheffield Terrace the stream's bankings became more heavily inundated with weeds, brambles, and brush. Another 150 ft. however found a wooded area, but with more walking accessibility along the stream's banks. Stream width was c. 3 - 4 ft., with a sandy bottom with occasional areas of small to medium size stones. There were some indications of stream erosion on the bankings.

The stream then entered into a double culvert, passing beneath Littlefield Lane (GPS Map Sect. G09). Culvert height was c. 3 ft. with a 6 ft. width. Stockpiled debris over time appears to have shifted the flow of the stream mostly into the right side culvert. Although some water flow does find its way through the blocked left side, that side is definitely more impeded than the other. After exiting the culvert the stream continued onward for about another 225 ft. The stream continued to feature a mostly sandy bottom, approx. 6 ft. width and a depth of 4 - 10 in.

The Final Culvert was located on property 36-46 on GPS Map Sect. G09. This property is located on Woodcock Lane (near the end where it meets Prendiville Way). The water was a little murkier here and deeper (c. 1.5 ft), but remarkably free of debris build up. A wire mesh “cage” was standing just to the left of the culvert, which we suspected to be a “beaver deceiver”.

The start (near Raymond Road)

a few hundred yards downstream

shallow and sandy

beneath land bridge at end of Draper Circle

stream somehow makes its way through this

pond off of Hemenway St.

the pond draining beneath Hemenway St.

continuing downstream

further along (no more channeling)

banking with erosion

stream exiting culvert near Prendiville Way

50 yards further downstream

looking upstream just before entering the final culvert

(the end) near end of Woodcock Lane

NE Marlborough Stream Study - Unnamed Stream #2
GPS Map Sections E08, F08, F09

(*Note: *each colored section of the walking stick shown in any of the following photos, is 1 foot*)

Map Segments : E08, F08, F09
Date(s): April 8 and 13, 2009
Observers: Frank Bennett and Bill Tate
Weather: cloudy, some sun, 45 - 55 degrees F
Recent Weather : had rained for several days prior to our visits

Stream Description:

Stream bottom: usually hard packed sand, some muddy areas, small stones/rocks prevalent too.
Water : usually clear, 3 inches to 1.5 ft deep, Water level seemed a little low in some places
Flow: generally slow moving with some areas of rippled flow
Gradient: slight
Sinuosity: mostly meandering
Stream Width: 2 - 6 feet
Reach: abundant vegetation: trees, bushes, low plants (abundance of skunk cabbage at the start)

Habitat:

Small woody and organic material, usually small low banks on both sides of the stream.

Human Alterations:

The area is abutted by a large housing development.... there were some examples of yard waste (grass clippings, leaves, tree branches) build-up at edge of woods and wetlands.

Riparian Area and Land Use:

As mentioned, the area is surrounded by a large housing development. Most of the area on the stream banks is wooded, with trees about 20 - 150 feet on either side.
Visible land uses include large houses, well kept yards and lawns, wetlands and wooded areas.

Recreation (None)

Wildlife:

Although actually not seeing any deer, found 7 piles of deer scat in one small area

Wildlife Habitat:

Trees, standing & fallen dead trees and limbs, stream banks, swampy areas, some grasslands.

ASSETS:

naturally beautiful area

PROBLEMS:

Didn't really see any problems

PRIORITIES:

Might want to check out culvert at the end of this stream (GPS Map Sect. F09 - property # 23-68) for blockage.

Unnamed Stream #2 begins in the marshy / wetland area (GPS Map Sect. E08) close to where Hemenway St. meets Sudbury St. At the least, it was a damp area with abundant cat & nine tails. In truly wet areas skunk cabbage flourished. From the right side a narrow tributary entered which when followed upstream, led to a culvert (1 ft. diameter) located on property #22-60 (GPS Map Sect.E08).

Water slowly flowing from the wetland area eventually meets up with the water flowing from the tributary to form a single stream which flows in an easterly direction towards Sheffield Terrace (GPS Map Sect. F09). This stream was usually quite narrow (1 - 1.5 ft wide) and its bottom varied from sandy - muddy - to leaf covered. In some places large stones (i.e. size of a loaf of bread) were clearly present. In this area at a small clearing in the woods, we found 7 piles of deer scat, seemingly almost systematically arranged in a small circle.

The stream slowly continued its way towards Sheffield St. where it entered a culvert which had a 2 ft. diameter. This was the only culvert on this side of the street. the stream had now widened as well to about 3 ft. However, on the other side there were 3 culverts. Pipes on left and in center measured 2 ft diameters, while pipe on right side measured 1 ft. across.

Water exiting these 3 pipes quickly formed into one main stream again with a width of about 3 ft. Again it continued its slow flow eastward for about 225 ft. where a tributary entered on the left. This tributary was traced upstream to its source, which turned out to be a flared culvert. This was also located on Sheffield Terrace about 200 ft. up the road from the previously mentioned culverts. Its width measured c.2 ft. high and 3 ft. wide.

Interestingly, this tributary ran through a rather wide “gully” which showed signs of water erosion at its bankings (exposed tree roots), perhaps indicating a much stronger rush of water at some previous point in time. This day the water was inches deep, about 3 -4 ft. in width, and slowly moving.

This tributary eventually met up with the main stream and continued on its way. Stream bottom was alternately sandy / muddy with occasional small stones. The stream continued c.200 ft where it spread out through a large swampy area (bottom two photos).

The stream exited from the large swampy area and as reached a culvert, which is located on GPS Map Sect. F09 - property # 23-68 on Prendiville Way. This culvert measured 2 ft across. The water here was c. 4 -12 inches deep and its bottom consisted mostly of sand and occasional rocks / stones, except close to the culvert, where it was a bit muddier. The stream’s width measured 4 - 5 ft.

This unnamed stream which began close to the intersection of Hemenway and Sudbury St. has traveled a distance of about 1800 feet (0.34 miles / 0.54 kilometers) to reach this point.

The start (near intersection of Hemenway & Sudbury St.) drained into two small streams

tributary from Sheffield Terrace entered into the main stream

the main stream

the main stream continued (photo left) and then eventually entered into an open wet area (photo below)

upon leaving the open area the stream appeared itself again (photo bottom left) and then emptied into this culvert just off Prendiville Way. (bottom right photo)

NE Marlborough Stream Study - The Beaver Dam(s) Stream
GPS Map Sections G09, H09, H08 (approx. 1/4 mile in length (0.40 km))

(*Note: *each colored section of the walking stick shown in any of the photos above, is 1 foot*)

Map Segments : G09, H09, H08
Date(s): April 8 and 13, 2009
Observers: Frank Bennett and Bill Tate
Weather: cloudy, some sun, 45 - 55 degrees F
Recent Weather : had rained for several days prior to our visits

Stream Description:

Stream bottom: usually muddy / leaf strewn .. one stretch sandy (just before entering Unnamed Stream #1)
Water : usually clear, 3 inches to 1.5 ft deep, Water level seemed normal except after clogged culvert
Flow: generally slow moving
Gradient: slight
Sinuosity: mostly straight....
Stream Width: 2 - 5 feet ..... *** *stream backup* due to clogged culvert 20 - 30 feet wide ***
Reach: abundant vegetation: trees, bushes, low plants

Habitat:

Small woody and organic material, usually small low banks on both sides of the stream.

Human Alterations:

The area is abutted by a large housing development. It appears that someone had opened up the beaver dams.

Riparian Area and Land Use:

The area is surrounded by a large housing development to one side . Most of the area on the stream banks is wooded, with trees about 20 - 150 feet on either side. Visible land uses include large houses, well kept yards and lawns,and wooded areas.

Recreation (None) ... but could be accessible path from the very end of Prendiville Way following stream.

Wildlife:

Saw a fisher (crossing Graham Path) and also there, 2 mallard ducks (male & female) and 2 garter snakes

Wildlife Habitat:

Trees, standing & fallen dead trees and limbs, stream banks, some grasslands.

ASSETS:

lovely area

PROBLEMS:

Two beaver dams have been “opened up” by someone.

May need revision as to flow direction of unnamed stream from vernal pools’ area, into the Beaver Dam(s) Stream. (GPS Map Sect. G09)

PRIORITIES:

Unclog culvert (not shown on GPS Map Sect. H09), but which has created a rather large “pond” behind it.

Investigate gnawed pile of discarded sticks near beaver dams.

Investigate green “algae” in wetlands upstream from Graham Path (GPS Map Sect. H08)

Revise GPS Map Sect. G09 (see above)

At the very end of Prendiville Way, about c.35 feet into the wooded area (GPS Map Sect. G09) rests a culvert through which the Unnamed Stream #1 flows. About 150 ft. upstream and ntering from the right was a tributary which I have named the Beaver Dam(s) Stream because of our find there. Looking UPSTREAM from that point one could barely make out what appeared to be a beaver dam.

Walking upstream it proved to indeed be a beaver dam which appeared to have been methodically opened / dismantled in the center of it, right to the stream bottom. There was no apparent evidence that this had been done recently. The water level here was shallow (6 - 12 in.) and about 3 -4 ft wide. On the other side of the dam (upstream) the stream's depth was about the same, but perhaps a bit wider (4-5 ft). The water was clear and only barely moving.

Heading further UPSTREAM (about 30 - 40 ft.) we saw a large pile of discarded branches. Frank walked through the stream to investigate and found that they were clearly cut down by beavers, as indicated by the gnawed markings at the ends of them. This pile was NOT right next to the dam and we wondered as to the reason for its being where it was ? This was also true (gnawed sticks) of the discarded pile of sticks and branches that we had observed moments earlier, in front of the beaver dam.

Continuing UPSTREAM about 150 ft. we came to a 2nd dam, which too had been methodically opened like the first, but not all the way down to the stream bed. The resulting "waterfall" dropped about a foot. The discarded pile of sticks in the front right of the photo were clearly gnawed. As before we could find no evidence that this had been done recently.

The stream behind the dam was about 6 -7 ft across, and about 14 - 16 in. deep. It soon narrowed however to about 3 ft in width, and another 150 ft upstream a culvert appeared. About 40-50 ft. before the culvert opening was another pile of gnawed, discarded sticks. We again questioned the reason for its being there. This culvert is not indicated on our GPS Map Sect. H09.

The stream flowed slowly, was only several in. deep, and about 3 ft. wide. The culvert opening on the other side (upstream) was almost completely clogged with grass, sticks, and stream debris. Because of the clogged culvert the resulting "pond" has occurred. Its depth appeared to be perhaps 2 ft. and its width approx. 20 - 30 ft. (GPS Map Sect. H08). The "pond" appears to be more of a "channel" but we attributed this to the topography of the landscape.

We had the pleasure of meeting the residents whose property abuts this portion of the stream and who have lived there for 16 years. We were told of sightings of deer, coyote, ducks, hawks, and snakes. They were aware of the beaver dams, and had photographed them as well a few years back. Near the end of their driveway, and below Graham Path a culvert passes beneath the street. There were also two side culverts. We were told that this was the first year (Spring) that they could not hear the gushing sound of water coming out of the largest pipe. The resident wondered if the beavers had moved further upstream.

There was only one culvert opening on the other side of Graham Path and it was 1 ft. in diameter. We continued upstream a short distance when the stream panned out into swampy / wetland areas. In places it became difficult to actual see the stream. However walking just a bit further the stream would become clearly visible once again. One interesting wet spot we chanced upon was characterized by a lime green "algae" (?) When trying to pick it up, it ran through our fingers like the water it was in. There seemed to be no substance to it. We could find no trace of any beaver habitation however. Map Sect. H08

Beaver Stream as it enters Unnamed Stream # 1 (looking upstream) ... First Beaver Dam

Second Beaver Dam (heading upstream) photo below

Unmarked (on map) culvert a few hundred feet upstream (photo right)

(photo below) other side of culvert (opening) almost completely clogged

(photo below right) resulting “pond” facing upstream and not far from Graham Path

NE Marlborough Stream Study - Vernal Pools
GPS Map Sections G08, G09

*Note: each colored section of the walking stick shown in any of the photos, is 1 foot)

Map Segments : E06, F05, F06, F07, F08, G09
Date(s): April 8 and 13, 2009
Observers: Frank Bennett and Bill Tate
Weather: cloudy, some sun, 45 - 50 degrees F
Recent Weather : had rained for several days prior to our visits

Stream Description:

Stream bottom: usually hard packed sand, some muddy areas, stones/rocks prevalent too.
Water : usually clear, 2 inches to 2 ft deep, Water level seemed normal.
Flow: generally slow moving
Gradient: slight
Sinuosity: mostly meandering
Stream Width: 1 - 6 feet (in a few spots)
Reach: abundant vegetation: trees, bushes, low plants (abundance of skunk cabbage)

Habitat:

Small woody and organic material, usually small low banks on both sides of the stream.

Human Alterations:
Does not appear to have any.

Riparian Area and Land Use:

As mentioned, the area is surrounded by a large housing development. Most of the area on the stream banks and vernal pool areas is wooded, with trees about 300 feet to all sides. However the well kept homes in the local development were barely visible in GPS Map Sect. G09 (lower left quadrant where most of this investigation took place)

Recreation (None)

Wildlife:

Saw snails, two garter snakes, mysterious tiny water creatures (1 in. long & 1/4 in. width - see report)

Wildlife Habitat:

Trees, standing & fallen dead trees and limbs, vernal pools, stream banks, swampy areas, some grasslands.

ASSETS:

naturally beautiful area

PROBLEMS:

Didn't really see any.
*** (Had some difficulty trying to determine our location at times, while looking / using our GPS Map Section G09. The stream indicated on the map did not seem to correspond to where we thought we were.

PRIORITIES:

Investigate further the vernal pools (GPS Map Sect G09) as to size and scope. (Could some be the result of human digging at some point in time????)

Investigate further the point where the stream leading from the vernal pool area (GPS Map Sect. G09) meets the Beaver Dam(s) Stream. Should the course indicated on the Map be reconfigured ????

Revise GPS Map G09 ????

NE Marlborough Stream Study - Vernal Pools
GPS Map Sections G08, G09

We started at a small section of stream, approx. 200 ft long, which began at an 18 inch culvert on Belmore Place quite near its intersection with Littlefield Lane (GPS Map Sect. G08). The stream then ran its 200 ft length underneath Littlefield Lane and onward another 300 ft. or so into a large swampy area (lower right quadrant of GPS Map G08). It flowed quite slowly and was only several inches deep. The stream panned out at one point just a short distance from the street, but then seemed to "re-channel" itself just a few yards further downstream. It also passed beneath a path made up of a pile of large boulders.

Continuing onward we eventually discovered two somewhat rectangular vernal pools (GPS Map Sect G09) right next to each other and separated by a narrow channel of land about 2 ft. wide. The larger of the two pools was about 20 ft. wide by 35 ft. long and appox. 15 inches to 1.5 ft. deep. It's bottom was leaf covered and solid enough to walk through, although our 16 in. high boots prevented us from examining all parts of the pool close up. Interestingly, the banking opposite the narrow land channel was about 6 - 7 ft. higher than the other parts banking the side of the pool. The high banking was also quite steep and showed signs of erosion as seen in the close up photo to the right.

The smaller pool was about 10 ft. by 15 ft. with a leaf covered bottom, and about the same depth as the other one. Because of the layout of this area we wondered if the land here had once been intentionally dug out some time ago ?

While wading through the larger of the two pools we found evidence of new plant life growing on the pool floor and in the smaller of the two pools we discovered a frog's egg mass.

We then made our way through the heavily wooded area surrounding the pools and discovered near by a third small pool c. 8 ft. by 12 ft., with leaf covered bottom, and c. 1 - 2 ft. deep. Opposite bankings here were also steep, and c. 5 - 6 ft. high. We could not notice any new plant / animal life here.

After once again roving through the bush for a short distance we came upon two other rather large, vernal pools quite near each other. (GPS Map Sect. G09) The two pools were parallel to one another and about 25 - 40 yards apart. We weren't sure if perhaps they were connected at some point. The water level in the photo was about 15 inches deep not too far from the shore and its bottom too was quite leaf cluttered.

It was here that we observed a 1/4 inch snail clinging to a leaf on the pool's bottom, and also in the water we spotted **two** rather tiny and strange looking "creatures". Each was about 1 inch long and extremely "thin" (c. 1 mm). Picking them up by cupping one hand in the water, and then later placing a finger in the cupped hand, Frank was able to get them on his finger, where they instantly "saddled up" to each other.

Leading from these vernal pools was a small stream that meandered for about 450 ft. down a slight incline and eventually emptied into the Beaver Dam(s) stream mentioned in our other stream report. It was about 25 yds. from the Beaver Dam(s) Stream that this stream seemed to abruptly stop and flow into a grassy area that had a very rocky (small stones) base beneath it. This location was in between the two beaver dam sights mentioned in our other Beaver Dam(s) Stream report.

first vernal pool

eroded banking

smaller pool adjacent to one above

frog egg mass

Vernal Brook # 3

first of 2 large pools parallel to each other

2nd of the larger pools

two “creatures” found in the pool

The 2 large pools emptied into a small stream (below left) which then found its way to the Beaver Dam(s) Stream. (bottom right photo)

Map Segments	North East Marlborough Sections: F11, F12, G10, G11, G12, H11, H12 (could not observe E12, E13, I10, I11 – too swampy)
Date	April 18, 2009
Observers	**Bob Belford, Andrea Belford**
Weather	Sunny, mild, 50-60 degrees

Stream Description

Stream bottom	Swampy, some channelized areas, some clear rock-bottom sections
Water	Clear in parts, swampy in parts, mossy/algae in parts – deepest parts 5-6"
Flow	Slight to almost stopping in some parts
Gradient	Low
Sinuosity	Swampy, Channelized
Reach	Still, some riffles

Habitat
Swampy, backyards, woodsy

Human Alterations
Culverts, Dams, Channels

Riparian Area and Land Use
As mentioned, many swampy areas where stream flow was still. Mostly surrounded by shrubs/brambles and wetlands/marsh. Land use visible from stream: residential, roads, wooded areas.

Recreation
None

Wildlife
Hawk, mallard ducks, deer tracks/droppings, beaver teeth marks on tree trunks, woodpecker, cardinal

Wildlife Habitat
Well vegetated, wetland areas with thick vegetation

Narrative
Started in section F11 at Hanlon Drive cul-de-sac. Before going left into F11, we headed into F12. There was a drain pipe with white foam, then clear water with steady flow and sandy rock bottom. Then there were a lot of overhanging brush/prickers/fallen trees that were heavy and jamming up the river, but not blocking the flow completely – yet. Then down the stream, the flow stopped, and the water was steady with a clear, sandy bottom. Then we really got into a swampy area with some slick, oily spots, black still water, and a blockage/dam of some sort. Here we saw 2 mallard ducks and heard a woodpecker. There were mudflats and vegetation/dead trees all around us and we couldn't go any further, so we walked back to the cul-de-sac.

Into F11, the stream was broken up by a driveway/bridge. There was blockage in front of bridge over driveway. All thru this section was moss/algae on a clear, rocky bottom with fairly steady running water. Although slippery while walking through, it was a pretty clean, clear flow. We saw a red cardinal, and homes along side here. There were also heavy fallen trees/debris across one area that should be removed.

Then we came to a culvert at Sudbury Street (G11), where we crossed over the road. On the other side was where the undercut/breakage of the channel was. The flow in the channel was clear, yet mossy/slippery with pretty forsythia overhanging.

In G10, we came to a 3-way intersection of the stream where small trees & brush were hanging over. To the right, went a small, short, babbling brook, with slight flow, rocky/sandy bottom, and 3-5" deep. To the left, there was no to slight flow, mostly due to debris hanging over. The bottom was sandy, with some brown muck. Continuing on, with very slight flow, and another area of debris over top that could be removed. Then we came to a 24" drain/rock wall with rapid flow of water coming out. There was a pretty walkway made by one home along the stream. Clear, steady flow with green algae rocky bottom. Animal droppings along here. At the end, we spoke to a homeowner that said he was so sad because recently, a hawk had come down and ate the ducks that had had made that their habitat for a very long time…..Here there was another 24" drain with fairly quick water coming out.

Then we walked back up to Sudbury Street and drove down the road to Carver Hill Rd (H12). This section started out with a double drain pipe culvert at the road with standing water that headed into a small swampy muck. From there, the stream went behind a home that had a few man-made tiny bridges over some stream parts. This home started section G12. They had a fence along the stream which signified it was their property. There were several areas of animal droppings along here, as well as deer prints (see photo) along the stream bed. The stream fell into a small babbling brook with sandy bottom and fairly clear water. Muddy, mucky vegetation and pine forest on both sides. We saw a small waterfall and a small beaver-eaten tree (looked fresh). There were a few limbs and trees that fell across that could be removed. Then again, there was too much brush/swamp area to go any further.

Problems

1. Undercut/crumbling/breaking concrete along bottom of channel walls (G11)
2. Fallen trees/organic debris areas mentioned above (F11, F12, G10, G12)

Assets

1. Minimal trash/litter
2. Well maintained/clear from neighboring residences

Priorities

1. Clean up/clear up fallen trees/debris in areas mentioned to help healthy flow of stream
2. Fix broken/undercut channel in G11

F11 Culvert Hanlon Dr. white foam

F12 Blockage Debris

F12 Overhanging Brush Blockage

F12 Slick Oily Spots

F12 Dam

F12 Swampy Mucky

F12 Black Still Water

F12 Sediment

F12 Blockage. Couldn't go further.

F11 Rock wall bridge driveway w blockage

F11 Blockage

F11 Green Mossy Water

F11 Green Mossy Water

F11 Fallen Tree Across Stream

F11 Waterfall

G11 Bridge Sudbury Street

G11 Undercut Channel Breakage

G11 Channelized, Forsythia	
 G11 Bridge other side of Sudbury Street	 G11 More Channel Breakage
 G11 Debris Overhang	 G11 Steady Flow
 G10 3Way intersection w small trees brush block	 G10 24-inch Drain with Rapid Flow of Water
	

G10 Drain at End House	G10 Animal Droppings
 G10 Blockage	 G10 Brown Muck in Water
 G11 Channel	 G11 More Channel Breakage
 2009 Stream Team 034	 H12 Sudbury Street Carver Hill Double Drainpipe

H12 Other Side of Road toward H11

H12 G12 Fenced in Part of Stream w House

G12

G12 Muddy, Mucky, Vegetative

G12 Beaver Tree

F12 Mallard Ducks

G12 Fallen Tree

G12 Large Uprooted Fallen Tree

G12 Base of Tree

G12 Swampy

G12 Too Brushy, Swampy To Go Further

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G12 Fairly Clear Water

G12 Waterfall

G12 Going into Smaller Stream

G12 Swampy

Stream Team Spring 2009 - Action Report by Priscilla Ryder, November 2009

The following action items are listed in the Stream Team Spring 2009 report. Each item is listed and the stream section noted. At the next stream team meeting in Spring 2010 (or sooner) a status report update will be provided so the team can track the progress being made on their discoveries.

Broadmeadow Brook (North of Sudbury Reservoir)

Stream section	Problem Identified	Assigned to:	status
C-15	Submerged tires 300 feet south of culvert on Hemenway St.	Conservation – to be assigned to volunteers on or before 2010 earthday cleanup.	
C-15	Check 12 " diameter plastic drain runoff comes from Hemenway St, and Linda Circle	Conservation will check and work with DPW if problem exists.	
F13	Oily sheen throughout	Conservation will check	Checked in July 2009 found restaurant dumping grease and oil along stream bank just below culvert on Rt. 20. Board of Health ordered this to stop. Will keep monitoring to see if sheen goes away.
F-13	Trash from Dunkin Donuts and next to Jo- Len	Conservation will check	Notice provided to Dunkin Donuts to do more trash pick up. Board of Health and Conservation will continue to monitor
H-15	Stagnant smelly water, green aquatic growth/vegetation (below sewer easement and Jordan Stables)	Conservation will check	
H-14	Culvert crossing Farm Rd. pipe is corroding at the bottom	Conservation will inform DPW	
H-15	Trash in stream tires and debris	Conservation will add to city cleanup list	
H-15	Grass clippings behind home on Helen Dr.	Conservation will inform	

		neighbors not to put clippings on stream bank- through letter	
Hop Brook Steam Section			
Stream section	Problem Identified	Assigned to:	status
H-12	Dark rusty water from 24" behind Hess Gas station	Conservation to check and follow up	
I-13	Orange water, pipe discharging to netting, water dirty, lots of trash	Conservation to check and follow up	This is a site of ongoing enforcement action against Waste Management Inc. and Post Rd. Auto. Enforcement and monitoring are ongoing through Conservation Commission and Engineering Dept.
H-13	Milky water and algae in pond nest to Halfway Cafe	Conservation to check and follow up	Checked June 2009 milky water and algae a result of discharge above, trash to be addressed during next clean up day with letter to restaurant owner too.
G-13	Trash at EWWTP entrance roadway to be cleaned	DPW to be notified	Was cleaned up during Clean Sweep 2009
H-15	Strong odor from water under Boston Post Rd. into Hager Pond	DPW to be notified	
H-10	Trash and green slim in water and along edge beside storage units.	Conservation will check and put on list for cleanup	
M-13	Air conditioner on side of road near culvert on Broadmeadow Rd.	Conservation will add to cleanup list	(need to check if it was removed)
NE Marlborough Stream Study			
C-5	Culvert near Goodail St. rocks above pipe are cracked	DPW to be notified-	

		Conservation will check.	
B-8	Hemenway St. extension pipe is rotted out, base of culvert is broken off	DPW to be notified	
D-6	Culvert at Sudbury St. Rocks are shifting	DPW to be notified	
F-12	White foam from drain pipe near Hanlon Dr. cul-de-sac	DPW to be notified	Samples taken, DPW is investigating an illegal drain connection (possibly washing machine connection.) Abutter also reported this.
G-11	Undercut/ crumbling/ breaking concrete siding in this channelized section	DPW to be notified	
F-11, F-12, G-10, G-12	Trees have fallen across brook, may cause blockage over time	DPW to be made aware of this. Removal only recommended if it becomes a problem.	
F-6	Unclog culverts in section F-6 off of Grogan Path (front corner of properties 22-107 and 22-108)	DPW to be notified	
F-5	Unclog culverts in sectionsection F05 off of Jean Road (between property lines 22-28 and 22-38)	DPW to be notified	
E-6	Unclog culverts in section section E06 Blanchette Drive (property 22-91 and across the street 22-89)	DPW to be notified	
F-7	Unclog culverts in section F07 (3 culverts beneath land bridge at end of Draper Circle)	DPW to be notified	

F-7	Unclog culverts in section F07 (grated culvert at end of pond next to Hemenway Street).	DPW to be notified	
F-8	Unclog culverts in section F08 double-culvert beneath Sheffield Terrace (prop. 22-68 and 22-76)	DPW to be notified	
G-9	Unclog culverts in section G09 (double culvert-left side..beneath Littlefield Lane (property 23-84)	DPW to be notified	
F-5	Revise GIS Maps to show culvert openings and substantial stream (not currently shown) section F05 off of Jean Road (between property lines 22-28 and 22-38)	DPW to be notified	
G-9	Revise GIS Map section G09 50 feet straight in from the end of Prendiville Way where it meets Woodcock Lane	DPW to be notified	
H-9	Unclog culvert (not shown on GPS Map Sect. H09), but which has created a rather large “pond” behind it.	DPW to be notified	
H-9	Investigate gnawed pile of discarded sticks near beaver dams	Conservation Dept. to investigate	
H-8	Investigate green “algae” in wetlands upstream from Graham Path (GPS Map Sect. H08)	Conservation Dept. to investigate	
G-9	Revise GPS Map Sect. G09 (see above)	DPW to be notified	