Blackstone River Watershed Association

Peters River Project Stream Survey

Summary Report

Project Coordinator: Michael Sperry
4/15/2015

Acknowledgements

Thanks to:

SAVE THE BAY®
NARRAGANSETT BAY

The Blackstone River Coalition

Team Members contributing to this survey:

Ellen Gerardi
Joanne Holahan
Josephine Sperry

Objective

THE RIVER

The Peters River originates and flows through Bellingham, Massachusetts and Woonsocket, Rhode Island eventually entering the Blackstone River. The subwatershed includes Arnolds Brook, Bungay Brook, Silver Lake, and Jenks Reservoir. The river northeast of Wrentham Road (South Bellingham) is primarily a small stream with access mostly limited to stream crossings. It flows through mostly residential development and wooded areas and is, for the most part, buffered. Southwest of Wrentham Road to the RI border, the river opens up a bit and passes close to residential/commercial land before returning to a somewhat buffered condition. Bungay Brook passes near 2 golf courses and runs very close to residential properties. Silver Lake obviously plays a major role in the water quality of the subwatershed. It is dam controlled, abutted by residential lots on it's bank, has a goose problem, and appears to also be fed by a stream with possible agricultural runoff (yet to be verified). Silver Lake itself, however, is beyond the scope of the project.

The Peters River in Woonsocket has been identified by RI DEM and others as impaired with high bacterial readings common. This is believed to be primarily attributable to outflow pipes (point-source) and runoff (non-point source) in the city. However, in order to fully investigate possible sources of impairment, the role of the Massachusetts section of the subwatershed must also be considered.

THE PROJECT

The project is a survey of the Peters River and two of its tributaries, Arnolds Brook and Bungay Brook performed during the summer and fall of 2014. The survey was undertaken by the Blackstone River Watershed Association (BRWA) under contract to Save the Bay as part of the investigation of the Peters River Watershed to identify possible causes of impaired water quality in the City of Woonsocket, Rhode Island. The survey area was confined to the area north of the RI/MA border predominantly in the town of Bellingham, MA and a small portion of Wrentham, MA.

The BRWA study was not intended to be a comprehensive shoreline survey of the target streams. The goal was to perform a general assessment of the watershed focusing on land use, outfalls, and inadequate or faulty stormwater management.

The survey methods included:

- direct field observation
- online research using public domain aerial/satellite photography, GIS, and municipal maps
- results from a companion Stream Continuity Survey also performed by the BRWA.

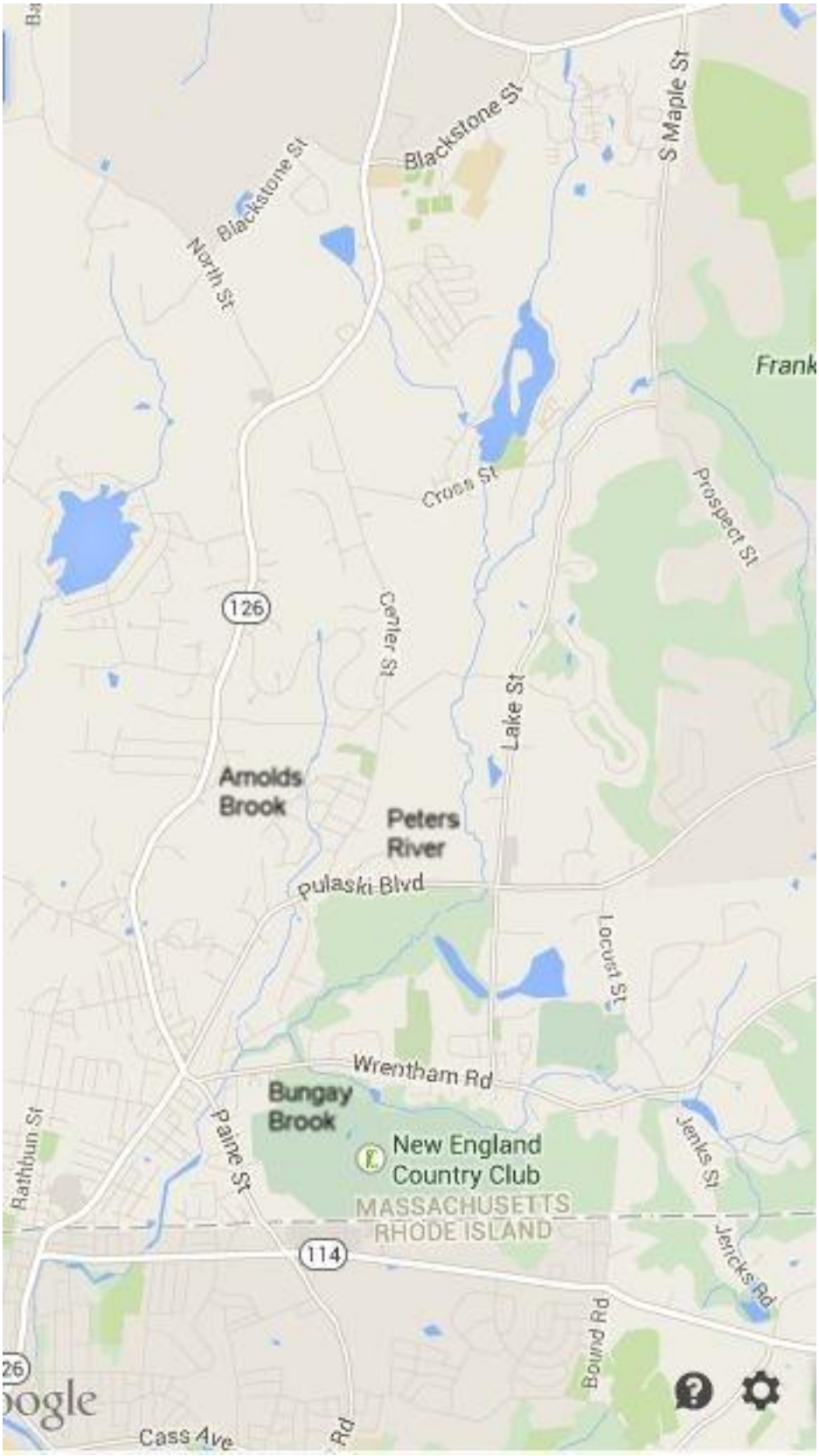

Figure 1 Overall map of the project area.

Summary of Findings

Peters River

The Peters River, a tributary of the Blackstone River, flows through Bellingham, Massachusetts and Woonsocket, RI. It is designated as a Massachusetts Department of Fisheries and Wildlife (MA DFW) Coldwater Fisheries Resource. Much of the river is listed as NHESP Estimated Habitats of Rare Wildlife and NHESP Priority Habitats of Rare Species. It is designated in the Massachusetts Department of Environmental Protection's (MassDEP) *Massachusetts Year 2012 Integrated List of Waters* as an EPA Category 5 impairment (Impaired or Threatened for one or more uses and requiring a TMDL). The listed impairment causes are copper, E.coli and lead.

Peters River-Silver Lake to Paine St

The Peters River is widely considered to begin at the dammed outlet of Silver Lake in Bellingham though it may be more accurate to place the origin at Curtis Pond (seasonal) to the North. Silver Lake (formerly Hoag Pond or Hoag Lake) is a man-made impoundment. The stream was first dammed in the 18th century and served a sawmill in the 19th century. At the turn of the 20th century, like many area lakes and ponds, it was developed as an amusement destination for the many streetcar lines in the area. The land surrounding the lake is now primarily residential. A parcel of town-owned, protected open space containing a park and beach are located at the southeast corner of the lake including the dam. The dam is listed as "Significant Hazard" by the state. Like many lakes in the area, Silver Lake is treated for invasive vegetation and experiences occasional beach closures for bacteria. It is listed as an EPA Category 4c impairment (Impairment not caused by a pollutant – TMDL not required). The listed impairment cause is Non-Native Aquatic Plants.

No survey was performed from The Silver Lake dam to the crossing at the Southern New England Trunk Trail (SNETT). After the dam, the stream crosses under Cross Street and through two residential properties. It then enters town-owned land containing public wells and DEP wetland (wooded marsh) and that abuts the SNETT. This land is almost completely forested.

SNETT to Railroad Street

The SNETT is an abandoned railbed that once supported passenger service from Boston to New York. The section that passes through the Peter's River subwatershed was built in 1849. The Peters River culvert is constructed of stone and granite block. Crayfish and deer tracks were observed at this crossing.

Figure 2 Culvert under the Southern New England Trunk Trail.

Figure 3 Aerial view of Peters River near the SNETT and Railroad St.

Between the SNETT and Railroad Street are large tracts of private land. To the west is a farm where no extensive cultivation was observed. To the east is a forested tract. No direct survey was performed on this section.

Railroad Street to Pulaski Blvd

The crossing at Railroad Street is newer construction consisting of 2 concrete pipe culverts embedded in a concrete bridge structure. The river enters the inlet at a sharp angle. The culverts present a mild to severe constriction to the stream flow. There is a stormwater outflow pipe at the outlet. The banks are thick with vegetation.

Figure 4 Peters River inlet at Railroad Street.

Figure 5 Peters River outlet at Railroad Street.

Figure 6 Peters River downstream from Railroad Street.

Between Railroad Street and Pulaski Blvd, the Peters River is mostly abutted by a few larger land parcels. It is all currently forested and the river corridor is DEP wetland. No direct survey was performed on this section.

Figure 7 Aerial view of Peters River from Railroad Street to Pulaski Blvd.

Pulaski Blvd to Paine St

The crossing at Pulaski Boulevard underwent a major reconstruction in 2010. There is a stormwater outflow pipe adjacent to the inlet. It is presumed that this comes from the detention basin adjacent to the Bellingham Lumber property at the corner of Lake St and Pulaski Blvd. Algae were observed in the outflow pipe. Small fish, crayfish, and, surprisingly, an eel were observed. On the outlet side of the crossing, the parking lot of Lake Street Auto, an auto body shop, lies adjacent to the river with a small buffer.

Figure 8 Peters River inlet at Pulaski Blvd.

Figure 9 Outflow adjacent to inlet at Pulaski Blvd.

Figure 10 Looking upstream toward Pulaski Blvd. Auto body shop on right.

Figure 11 Outflow adjacent to inlet at Pulaski Blvd.

The river crosses under a dry-layed stone footbridge and enters a large town-owned parcel. Other than the inevitable ATV trails, the parcel is forested. Within the parcel, there is a small town beach in Arcand Park on Jenks Reservoir. The reservoir feeds into the Peters River via a dam and small stream. The reservoir is bisected by Lake Street. Jenks Reservoir is listed as an EPA Category 4c impairment (Impairment not caused by a pollutant – TMDL not required). The listed impairment cause is Non-Native Aquatic Plants.

The river continues through town-owned land, some of which is protected open space, with the exception of one abutting private parcel. No direct survey was performed on this section. The river corridor is designated DEP wetland. It then enters a public water supply area, the site of a new water treatment plant, and meets up with Bungay Brook. Below the confluence with Bungay Brook, the river passes through a residential area. No direct survey was performed on this section. The river forms the lot boundaries and seems well buffered. Within this area, the river meets up with Arnolds Brook and continues to Wrentham Road.

Figure 12 Aerial view of Peters River from Pulaski Blvd. to Wrentham Road.

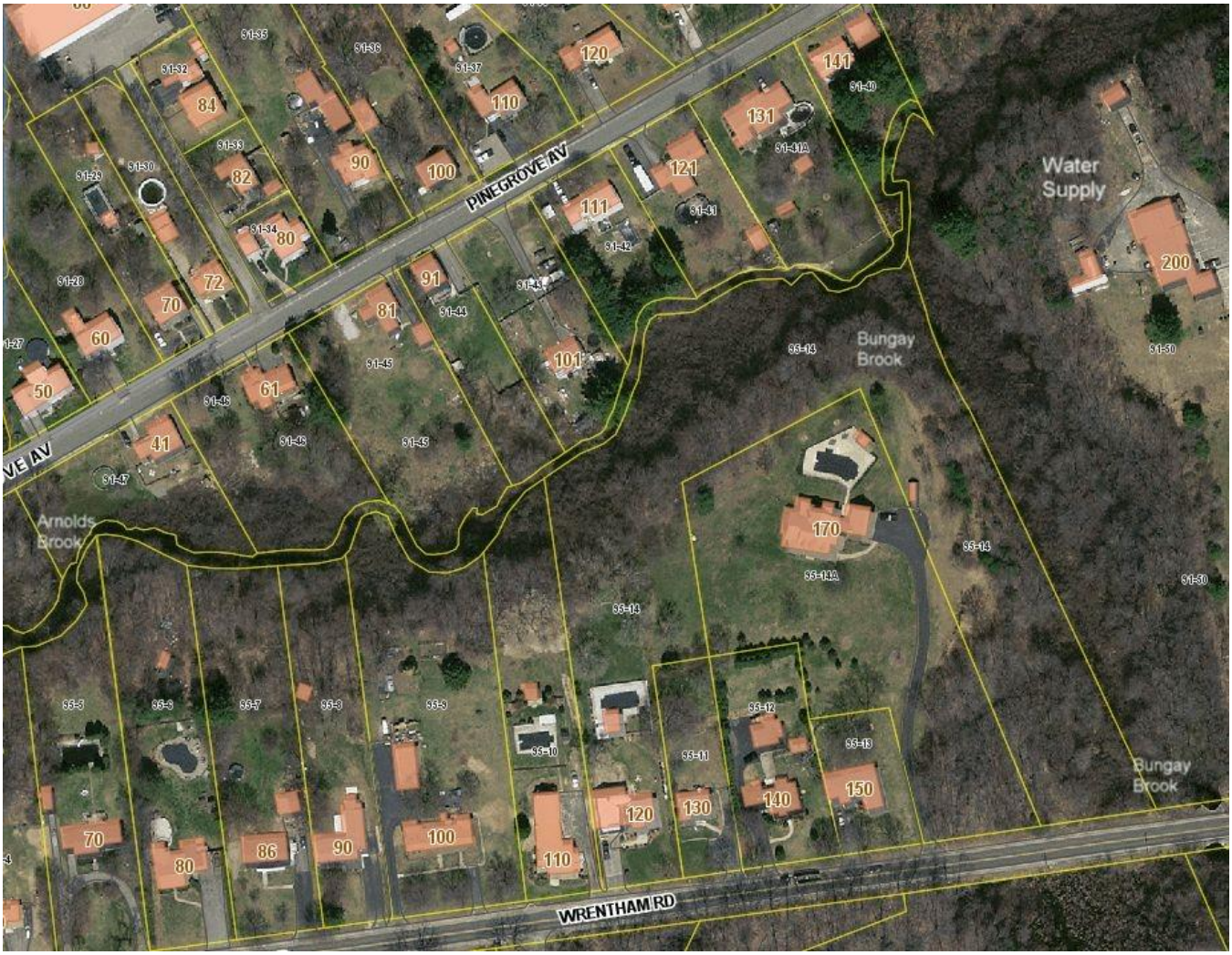

Figure 13 Confluence of Bungay Brook and Arnolds Brook with the Peters River.

At the Wrentham Road crossing, the usual thorns/wild grape vegetation was observed. Under the bridge, stormwater outflow caused deep scour near the outlet. The river contains man-made "artifacts". Below the crossing, we see the last of the natural streambank before a section of alteration between Wrentham Road and Paine Street. A concrete retaining wall replaces the bank on the east side. Yards and a paved lot extend to the river. Several outflow pipes, a foot bridge and an aerial pipe crossing are present.

Figure 14 Peters River outlet at Wrentham Road

Figure 15 Outflow at Wrentham Road causing scour.

Figure 16 Peters River downstream from Wrentham Road.

Figure 17 Altered section between Wrentham Road and Paine Street.

Peter's River-Paine St to MA-RI border

The crossing at Paine Street is showing signs of disrepair and erosion. The culverts appear to present a restriction to the stream. This location is a site in the Blackstone River Coalition Water Quality Monitoring Program. Crayfish were observed.

Figure 18 Peters River inlet at Paine Street.

Figure 19 Peters River outlet at Paine Street.

Downstream of the bridge, on the west side, a detention pond was created during recent reconstruction of Pulaski Boulevard and the Crooks Corner intersection. A sequence of photographs were taken to document the pond.

Figure 20 Detention pond adjacent to Peters River at Paine St.

Figure 21 Detention pond adjacent to Peters River at Paine St. - Photo 1.

Figure 22 Detention pond adjacent to Peters River at Paine St. - Photo 2.

Figure 23 Detention pond adjacent to Peters River at Paine St. - Photo 3.

Figure 24 Detention pond adjacent to Peters River at Paine St. - Photo 4.

Figure 25 Detention pond adjacent to Peters River at Paine St. - Photo 5.

Figure 26 Detention pond adjacent to Peters River at Paine St. - Photo 6.

Shoreline observations were made at the upstream outlet of the retention pond and at the end of Orchard Street. The near (west) banks are vertical and muddy. The far (east) banks are steep, vegetated, and undercut. The water is clear and flowing well.

Figure 27 Upstream from detention pond outlet

Figure 28 Across from detention pond outlet.

Figure 29 downstream from detention pond outlet.

Figure 30 Upstream from Orchard St.

Figure 31 Across from Orchard St.

Figure 32 Downstream from Orchard St.

The final section of river in the survey is characterized as a corridor between residential and some commercial properties. The stream is reasonably well-buffered but there are some close residential lots. Streets on the west side run perpendicular to the river and dead end at river bank.

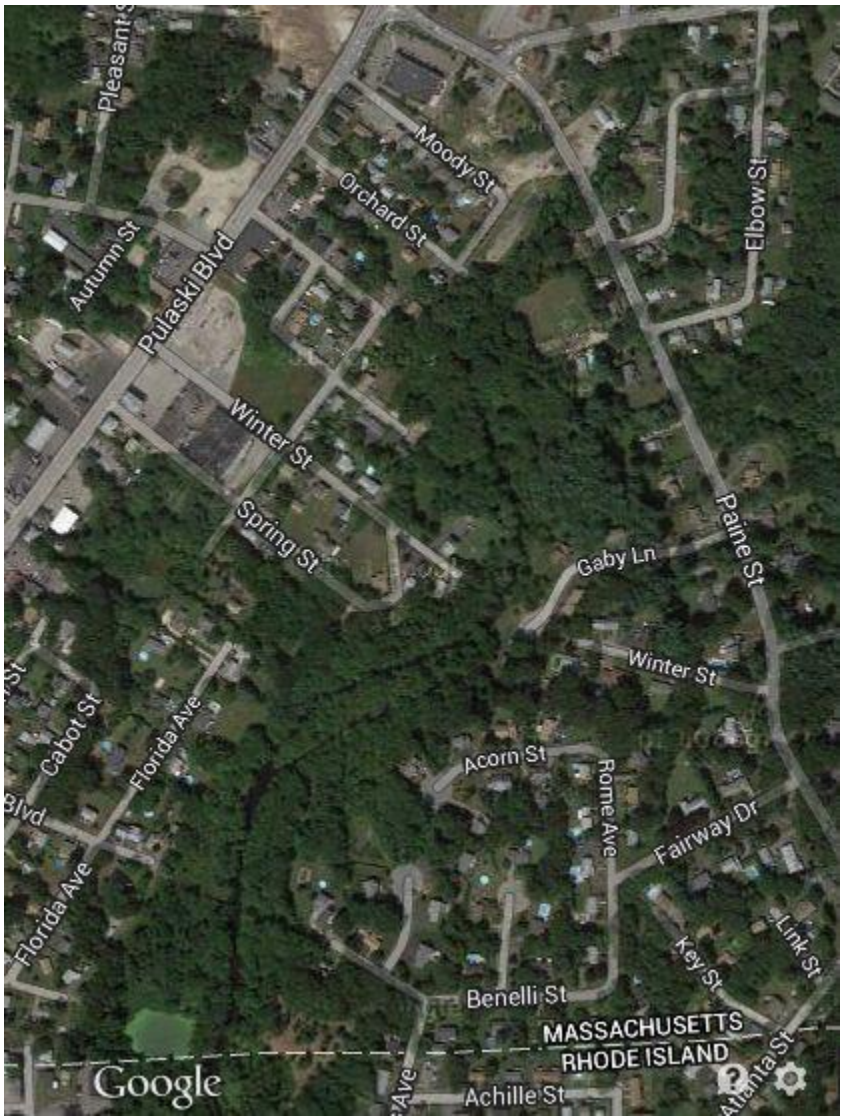

Figure 33 Aerial view of Peters River from Pain Street to the Rhode Island border.

Summer Street (west side) is a dead end with an outflow culvert exiting at the center of the road feeding a stream that leads directly to the river.

Figure 34 Outflow culvert at end of Summer Street.

On Gaby Lane (east side) there is a field shared by 2 residential properties extending to the river bank . There is a stream entering on the opposite bank.

Figure 35 Field adjacent to Peters River on Gaby Lane looking upstream.

Figure 36 Field adjacent to Peters River on Gaby Lane looking across. Stream visible on opposite bank.

Figure 37 Field adjacent to Peters River on Gaby Lane looking downstream.

Figure 38 Outflow from Winter St to Peters River.

On Winter St (west side), the stream seen from Gaby Lane is the outflow of a culvert leading from the street. There is approximately 50 feet of wooded buffer between the residential lots and the river. Walking downstream from Winter St., backwaters and properties sloping to the river are observed on the east bank. The west bank is vertical and under cut. Some duckweed and natural sheen was observed and the stream is flowing slowly. The photographs are in sequence moving downstream.

Figure 39 Upstream view from Winter St.

Figure 40 Across and upstream from Winter St.

Figure 41 Across from Winter St.

Figure 42 Downstream from Winter St.

Figure 43 Photo 1 walking downstream from Winter St.

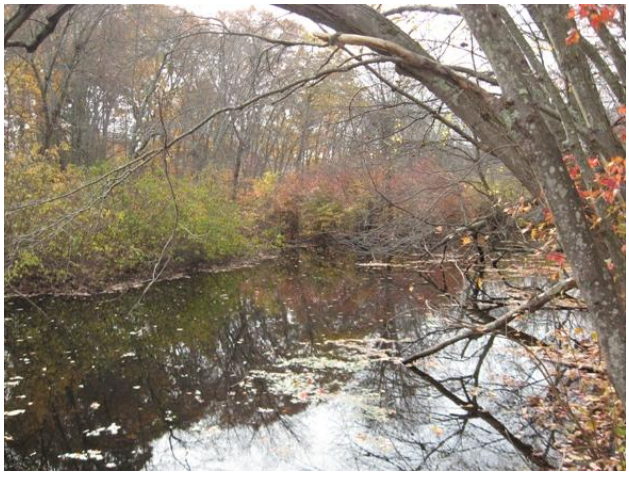

Figure 44 Photo 2 walking downstream from Winter St.

Figure 45 Photo 3 walking downstream from Winter St.

Figure 46 Photo 4 walking downstream from Winter St.

Figure 47 Photo 5 walking downstream from Winter St.

Figure 48 Photo 6 walking downstream from Winter St.

No further survey was performed on the west side of the river. Access was limited by thick vegetation and "no trespassing" signs.

At Benelli St (east side), a trail was followed west from the town pumping station, through forest to the river. Behind the station and southwest through the woods to a field that straddles the RI border. There are signs of erosion and flooding.

Figure 49 Upstream from pump station trail.

Figure 50 Downstream from pump station trail.

Figure 51 Across from pump station trail.

Figure 52 Upstream from field behind pump station.

Figure 53 Across from field behind pump station.

Figure 54 Downstream from field behind pump station.

Arnolds Brook

Arnolds Brook is a small tributary feeding the Peter's River. It is designated as a Massachusetts Department of Fisheries and Wildlife (MA DFW) Coldwater Fisheries Resource. It is designated in the Massachusetts Department of Environmental Protection's (MassDEP) *Massachusetts Year 2012 Integrated List of Waters* as an EPA Category 5 impairment (Impaired or Threatened for one or more uses and requiring a TMDL). The listed impairment cause is E.coli. Portion underground

Whitehall Way to Southern New England Trunk Trail (SNETT)

Arnolds Brook begins in a drainage and small pond north of Whitehall Way. The land surrounding the pond is owned by the Town of Bellingham. The brook passes under Whitehall Way through a fairly new culvert. There have been unconfirmed reports of beaver activity in the area. The land abutting the brook is also Town owned until the stream enters a residential lot on Fox Run Road. The Town-owned parcels are probably open space transfers resulting from the adjacent residential developments. Both parcels are wooded and contain DEP Wetlands (Wooded Marsh) providing a buffer for the stream.

Figure 55 Arnolds Brook upstream residential lot on Fox Run Road.

The brook passes through the residential property and under Fox Run Road. It then passes through a residential lot and two forested private parcels before passing under the Southern New England Trunk Trail (SNETT). Apart from the two residential parcels, the brook passes through woods. The crossing at Fox Run Rd probably presents a flow restriction during the peaks of a likely widely varying stream. When surveyed, the water level was low to moderate but a resident informed us that the spring flow is very high. Frogs and a Robber Fly were observed. Purple Loosestrife was observed at the inlet side of the Fox Run Road crossing.

The Arnolds Brook double culvert under the SNETT railbed is constructed of stone and granite block. The crossing was surveyed on July 30 and, as seen in the photo, flow was very low. However, there is strong evidence from the adjacent streambanks that the flow is seasonally varying and the culvert presents a restriction in the spring.

Figure 56 Arnolds Brook inlet at SNETT.

Figure 57 Arnolds Brook downstream from SNETT. Inlet to underground portion of brook.

Figure 58 Inlet to underground portion of Arnolds Brook.

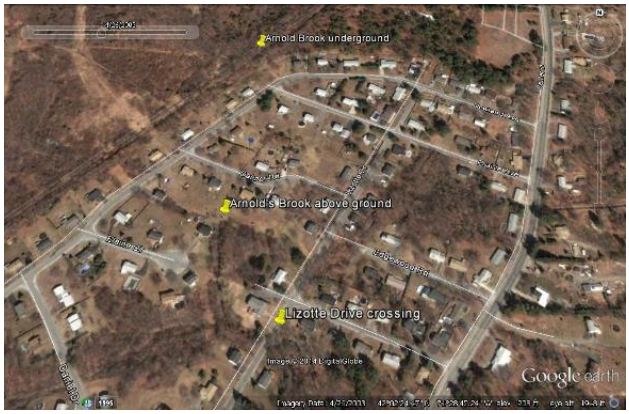

Figure 59 Arnolds Brook underground section downstream from SNETT.

SNETT to Lizotte Drive

Just downstream of the SNETT crossing Arnolds Brook transitions to an underground pipe. Evidence suggests this is a restriction to flow in the spring. The structure surrounding the entry pipe is in disrepair. The underground stream crosses two streets and several residential properties developed in the early to mid 1960's. The stream surfaces in a small wetland in the midst of the development and continues to Lizotte drive.

Lizotte Drive to Pulaski Blvd

At the Lizotte Drive crossing, the brook enters a culvert about 70 feet from the road. The banks are vegetated with the typical mix of thorns, poison ivy and wild grape. The outlet of the Lizotte Drive crossing shows signs of erosion. An outflow pipe, presumably stormwater, is visible adjacent to the crossing outlet. Another outflow enters from the adjacent property perpendicular to the stream. The stream then travels behind residential parcels to a more commercial area at Pulaski Boulevard.

Figure 60 Arnolds Brook outlet at Lizotte Drive.

Figure 61 Outflow from adjacent property at Lizotte Drive.

The inlet side of the Pulaski Blvd crossing is bordered by commercial property on both sides. The left side is an open field and small pond found to be choked with duckweed. On the right is an automobile repair facility. The parking lot is a good distance from the brook but gulleys from lot to stream bank were observed. There is an outflow built into the culvert structure on the left. Crayfish and small fish were observed. Patches of duckweed were observed.

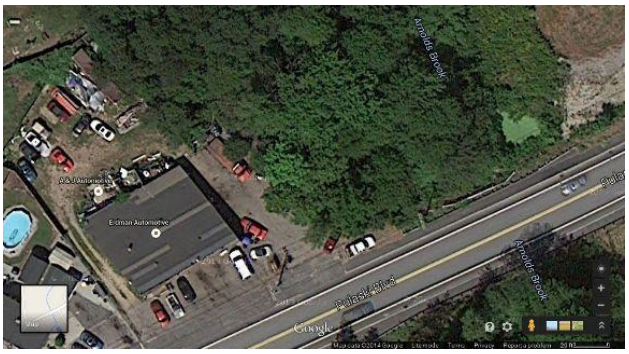

Figure 62 Commercial property adjacent to Arnolds Brook inlet at Pulaski Blvd.

Figure 63 Small pond adjacent to Arnolds Brook inlet at Pulaski Blvd.

Pulaski Boulevard to Peter's River

The outlet side of the Pulaski Blvd crossing is different from the inlet. It is more open and less overgrown. There is a detention basin at the the corner of Deer Run Rd and Pulaski Blvd that feeds into the brook. Small fish (< 3") were observed. Patches of duckweed were observed. One clump of Japanese Knotweed was observed on the bank.

Figure 64 Arnolds Brook downstream of Pulaski Blvd.

Figure 65 Flow from detention basin adjacent to Arnolds Brook at Pulaski Blvd/Deer Run Road.

The brook then flows through a corridor of DEP Wetland and Town Open Space between commercial properties on Pulaski Boulevard and Residential Properties on Deer Run Road. One of the commercial properties of interest is the former site of the Bellingham Drive-in, a large undeveloped parcel. The site was listed as a High Priority Wetland Restoration Site in the Army Corps of Engineers *Blackstone River Watershed Feasibility Study*. The corridor was not surveyed but appears to be forested. The stream exits the corridor and flows through a residential area with lawns extending to the banks.

The brook then crosses Pine Grove Ave. A stream exiting from a culvert on the adjacent residential lot enters from the right. Fish were observed at the outlet. Japanese Knotweed is starting to colonize the streambank at the outlet. Arnolds Brook enters the Peter's River just downstream of the crossing.

Figure 66 Arnolds Brook upstream from inlet at Pine Grove Ave.

Figure 67 Stream entering Arnolds Brook from culvert under adjacent properties.

Figure 68 Fish observed at outlet of Arnolds Brook at Pine Grove Ave.

Bungay Brook

Bungay Brook begins as a confluence of small streams in Hales Pond in Wrentham, MA. In its short trip (about 1.9 miles) to its meeting with the Peters River, Bungay brook generally follows Wrentham Road in Bellingham passing through open land, residential developments, and a large golf course. The stream is small and, for its short length, has four road crossings.

Jenks Street

Upstream of Hales Pond, Bungay Brook passes through a 2005 residential development. The stream is surrounded by protected open space owned by the town of Wrentham which contains DEP wetland areas. The crossing at Whipple Brook Road is well designed providing ample passage but was found to be blocked by a stone ford. Macroinvertebrates, frogs and animal tracks were observed.

Figure 69 Bungay Brook - Whipple Brook Road crossing.

Figure 70 Macroinvertebrate - Bungay Brook at Whipple Brook Road.

Figure 71 Tracks - Bungay Brook at Whipple Brook Road.

Figure 72 Hales Pond.

Figure 73 Bungay Brook downstream from Jenks Street. Part of structure seen on left.

The outlet of Hales Pond passes immediately under Jenks Street. The impoundment is created by an abandoned sluiceway structure on the downstream side of the road. The Brook passes through DEP wetlands and under West St. There is a USGS data collection station at the crossing. The stream then passes between residential properties and the small golf course that bears its name until it crosses Wrentham Road.

Wrentham Road near Squire Lane

The crossing at Wrentham Road near Squire Lane is in need of attention. The crossing is a mixture of granite block (inlet) and corrugated steel/concrete (outlet) indicating that the road was either widened or a wash-out was repaired. The road is sinking toward the inlet side allowing stormwater to enter the stream directly from the road surface. The inlet culvert appears to restrict stream flow. The septic system for the residence at the corner of Squire Lane and Wrentham Road is being replaced (failed cesspool) at the time of the writing of this report. The old system was likely in the Title V buffer zone. The status of the systems on the neighboring 2 properties is unknown but they may also fall in the buffer zone.

Figure 74 Bungay Brook outlet near Squire Lane showing varying construction.

Figure 75 Wrentham Road slumping toward Bungay Brook inlet.

After crossing Wrentham Rd, the brook passes through and behind residential properties and enters a large golf course. No survey activity was performed in this stretch until the next crossing at Wrentham Rd near the new water treatment plant.

The land adjacent to the brook on both sides of Wrentham Road at this crossing is town-owned, protected open space and a public water supply. This protection extends to the confluence with the Peters River.

Recommendations for Further Study

With a few exceptions, the surveyed portion of the Peters River sub-watershed appears to be in fair shape and relatively free of major impairments. Small fish, frogs and tolerant species like crayfish were observed throughout the area. Further investigation will likely find some issues, likely correctable. This investigation is warranted, especially if companion surveys within the overall project indicate a contribution to the impairment of the Woonsocket portion of the river from the target bodies in this study.

On the Peters River, the following parcels are of interest for future investigation or monitoring:

The contribution of Silver Lake to the health of the stream.

Peter Brook Sawmill.

Large parcel (development potential) but buffered by town owned protected open space.

Former town landfill (inactive, closed 1973).

Further investigation on Arnolds Brook should include a look at the area near the SNETT, stormwater management practices at Pulaski Boulevard and within the residential properties, and a review of activity and future plans at the former Bellingham Drive-in which abuts the stream.

Possible areas of further investigation on Bungay Brook include the status of septic systems in the first 1/3 of the brook and the stormwater management and landscaping practices of the large golf course and a restaurant/function hall that abut the stream.

References

OLIVER: MassGIS's Online Mapping Tool
http://maps.massgis.state.ma.us/map_ol/oliver.php

Town of Bellingham interactive assessor's map.
http://www.mapsonline.net/bellinghamma/index.html

Google Earth and Google Maps

Massachusetts Year 2012 Integrated List of Waters
www.mass.gov/eea/docs/dep/water/resources/07v5/12list2.pdf

Map-Bellingham Conservation Land Open Space and Wetlands
http://www.bellinghamma.org/Pages/BellinghamMA_webdocs/BellinghamMaps