

Green River Assessment: Report & Action Plan



**Housatonic Watershed
Green River Stream Team 2017**





Housatonic Valley Association

The Housatonic Valley Association (HVA), founded in 1941, works to conserve the natural character and environmental health of our communities by protecting and restoring the lands and waters of the Housatonic Watershed for this and future generations.



The shoreline survey form and the concept of the Stream Teams is a statewide program coordinated by the Division of Ecological Restoration



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I. Introduction: The Green River Stream Team

After 45 years of federal, state & local action under the Clean Water Act of 1972, most of the direct sewage and wastewater discharges into our waterways have been eliminated. However, a recent report by the Federal Environmental Protection Agency (EPA) classifies more than half of the rivers in the U.S. as still not safe for swimming and the fish are not safe to eat.

Today, pollution more commonly comes from “non-point sources”, such as stormwater runoff from streets, parking lots & lawns. Failed septic systems, soil erosion, and seepage from abandoned dumps and landfills are also contributing factors. Much more needs to be done to improve our water quality, and these improvements depend on the proper conduct of citizens, industry and municipalities.

These are difficult problems that need creative solutions and constant oversight. Government agencies and regional environmental groups are striving to help communities find practical answers to water quality issues through partnerships with community leaders, industry, and concerned citizens. The first step in the process is to obtain accurate, local information on the quantity and quality of water flowing through our neighborhoods. We need to know the condition of the river and surrounding environment to help us understand all aspects of the pollution that comes from our everyday decisions and actions.

The Green River Stream Team is one of the teams formed by the Housatonic Valley Association (HVA) in the Housatonic Watershed in Massachusetts to collect visual data that increases our knowledge of the condition of the river and its adjacent landscape. The teams are comprised of local community volunteers that act as the ‘eyes and ears’ of their community. These volunteers identify and record the present conditions and character of the river.

The Green River originates in Canaan, New York north of Fog Hill Road, and terminates at the confluence of the Housatonic River in Great Barrington. The river is approximately 18 miles long and flows through several towns; Canaan, Austerlitz & Hillsdale, New York and Alford, Egremont, and Great Barrington, Massachusetts. In New York, the river is classified by the New York Department of Environmental Conservation as having ‘non-impacted water quality conditions’, and is approximately 8.2 miles long¹. In Massachusetts, the river is classified as a Class B, Cold water Fish Resource (CFR) by the Massachusetts Department of Environmental Protection and is approximately 10.1 miles long.² Class B waters are designated as habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary (for example, swimming) and secondary (for example, boating) contact recreation. It is among one of the best trout streams in Massachusetts.

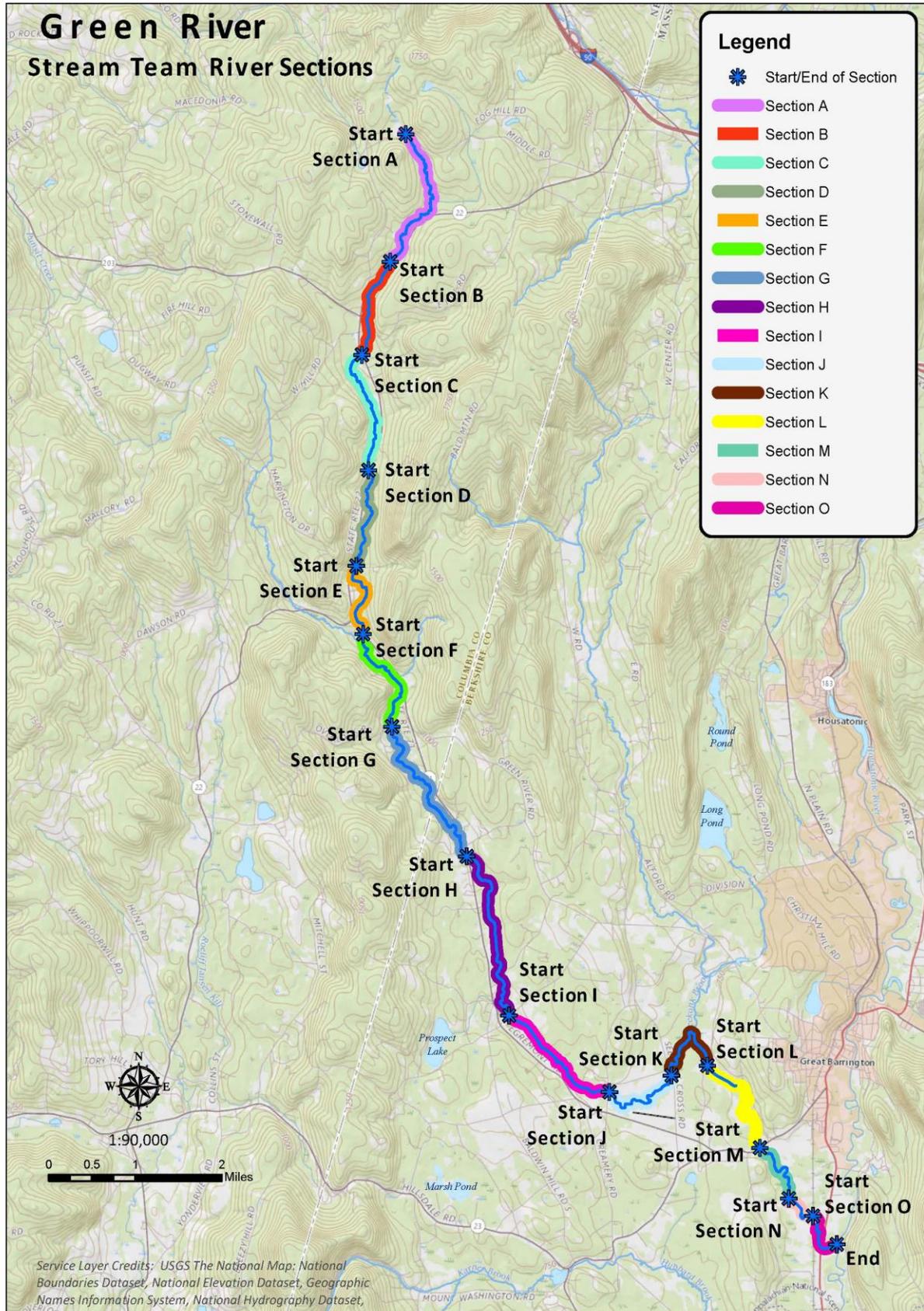
The Green River was divided into 15 sections. Within each section areas were identified as public attributes others as areas of concern that need remedial action. HVA together with team members have prioritized the importance of these projects, and will work with the community to decide which recommended actions should be pursued

This report is intended as a management resource and not as a paddling guide to the river. HVA has published a ***Paddling Guide to the Housatonic River in Berkshire County*** which is available on line at www.hvatoday.org or by contacting an HVA office

¹Source: www.dec.ny.gov/docs/water_pdf/pwllhous08.pdf

² Source: <https://www.mass.gov/service-details/what-is-a-cfr>

II. Map of the Green River & Stream Team Sections



III. Section Descriptions and Proposed Action Items

Refer to Section Maps and Feature Tables beginning on page 32 identifies specific findings are located on the Section Maps.

(Please note in the narrative and tables: Facing downstream, river right refers to the right bank and river left refers to the left bank.)

Section A: Fog Hill Rd to Route 22 Crossing (north of Osmer Road), Austerlitz, NY

Surveyors: Maureen Wilson & Jim Newberry

Date of Survey:	July 17, 2017
Distance:	1.8 miles
Elevation:	1,460 – 1,215 feet
Tributaries:	3, unnamed tributaries
Access Points:	Informal access at Fog Hill Rd and Route 22 Bridges
Associated Ecologically Sensitive Areas:	Unknown
Conserved Properties:	State owned protected area

Section Overview:

This section of the Green River flows predominately through the Harvey Mountain State Forest which is managed by the New York Department of Environmental Conservation.³ The river flows through forested land and is undisturbed by any human development except for the crossing at Fog Hill Rd. The river banks are vegetated with a forested riparian buffer providing healthy wildlife habitat conditions. As the river parallels Route 22 at the southern end of this section, the river passes by one house (river right).

Fog Hill Road is the first access site used to survey the Green River. Upstream of Fog Hill Road is a small pond 0.8 miles, and a larger, unnamed pond 0.6 miles above that pond, but the area is road less, undeveloped, and accessible by hiking trails or old woods roads only. South of Fog Hill Road, an old woods road crosses the river twice.

The river's width ranges from about 4 feet at Fog Hill Road to 20 feet near the Route 22 Bridge. The river's substrate is comprised mostly of gravel, cobbles and boulders with depths of about 1 foot and a slight current for the entire stretch. There are numerous downed trees.

³ Harvey Mountain State Forest website link: <http://www.dec.ny.gov/lands/66460.html>

Section A: Fog Hill Road to Route 22 Crossing (north of Osmer Road) Austerlitz, NY...continued

Section Condition:

This section of the river has very few issues as it flows primarily through protected state forest land. Natural bank erosion is occurring with numerous downed trees blocking passage. The only evidence of recreational activity is of target practice from a gun. Invasive phragmites was encountered at the Fog Hill Road intersection and Japanese knotweed noticed at the head of a tributary feeding the Green River (at the intersection of Fog Hill Road and Middle Road). Multiflora rose was encountered along this stretch and made passage difficult.

At the southern end of this river stretch where the river parallels Route 22, stormwater runoff is likely an issue and a large pipe possibly carrying runoff was observed about 50 – 75 feet east of the river along Route 22. Close to the end of the section is a private driveway bridge, about 2 – 3 feet above the river, which appears in need of repair. Bank erosion is also evident just upstream of the bridge.

Where Fog Hill Rd intersects with Middle Rd., (unnamed tributary No bottom pond outflow) there is a large amount of knotweed, which has evidence that someone has started to remove this invasive.

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Large tract of state protected land • Healthy wildlife habitat 	<ul style="list-style-type: none"> • Rte. 22 probable storm drain outfall • Japanese knotweed at intersection of Fog Hill and Middle Road crossing • Invasive plant, <i>Phragmites australis</i> at Fog Hill Road crossing • Invasive plant, Japanese knotweed, seen at Fog Hill Road crossing of tributary of Green River 	<ul style="list-style-type: none"> • Investigate possibility of working with NY DOT on diverting direct stormwater runoff into river • Investigate possibility of invasive species management • When Rte. 22 bridge is replaced, encourage replacement that meets state guidelines • Remove Japanese knotweed at tributary crossing on Fog Hill Road to prevent additional patches establishing downstream

Section B: Route 22 (1st crossing, north of Osmer Road) to Route 22 (2nd crossing, north of Harvey Mountain Road) Austerlitz, NY

Surveyors: Marie Raftery, Dylan LaChance

Date of Survey: August 15, 2017
Distance: 1.2 miles
Elevation: 1215 – 1106 feet
Tributaries: 2, unnamed tributaries
Access Points: Route 22 Crossings
Associated Ecologically Sensitive Areas: Unknown

Section Overview:

This section of the Green River parallels Route 22 for the entire section. In the first half of the section the river the road are very close to each other, but the second half there is greater distance between the two. The river flows in a southerly direction on eastside of the town of Austerlitz and crosses East Hill Rd before veering towards Route 22 and going under it again. The upper section is forested especially on the east side of the river. There were a few residential homes and related bridges scattered along the entire section. In the southern end of this section, the river passes behind the town center. At the time of the survey, the lower part of this section was dry while the remainder had just a couple of inches of water. The substrate throughout is cobbles and gravel.

Section Condition:

The upper section had clear water, and signs of fish were evident. This flow of water continued until East Hill Rd where the water disappeared underground from here to the end of this section. Algae and possibly Didymo (*Didymosphenia geminata*) was observed.⁴

The river is buffered most of this section by an extensive forested riparian on the east side of the river. However, stormwater runoff is likely entering from Route 22 on the west side of the river especially where it flows close to the road. One probable storm drain outfall pipe was observed.

Where there is development some property owners are mowing their lawns up to the river's edge. Invasive plants were observed along this section, particularly at the southern end, including patches of Japanese knotweed, multiflora rose, and purple loosestrife. There was no evidence of recreational use on this stretch of river.

⁴ Refer to Appendix C (page XX for information about Didymo, an algae that is possibly invasive.)

Section B: Route 22 (1st crossing, north of Osmer Road) to Route 22 (2nd crossing, north of Harvey Mountain Road) Austerlitz, NY...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> Middle part of this section had clean water and a healthy mix of vegetation on both sides 	<ul style="list-style-type: none"> No water in lower section. Water seemed to disappear underground Dense invasives growing on lower section (Japanese knotweed, multi-flora rose and purple loosestrife) Lack of vegetated buffer behind some residential and commercial properties Stormwater runoff from Route 22 	<ul style="list-style-type: none"> Investigate possibility of removing invasive plants – especially Japanese knotweed Work with towns and state to determine if the disappearance of the river is natural or human impact. Educate riverside land owners about the benefits of vegetated buffers Remediate stormwater runoff



Section B was dry at the time of the survey Photo by Dylan La Chance

Section C: Route 22 (2nd crossing, north of Harvey Mountain Road) to Route 22 (3rd crossing)

Surveyors: Dylan LaChance

Date of Survey: August 10 2017
Distance: 1.5 miles
Elevation: 1106 – 1051 feet
Tributaries: 2, Unnamed
Access Points: Informal access at Rte. 22 Bridges
Associated Ecologically Sensitive Areas: Unknown

Section Overview:

The Green River heads west and then south again as it follows the west side of Route 22 (at a distance of 500+/- feet) before crossing Route 22 again. The river channel, which continues to be a mix of cobbles, gravel and, in places, boulders was dry for part of the section during the survey. Where the river flowed it ranged from very shallow (just a couple of inches) with a fast current to occasional pools with almost no current (especially behind the beaver dam). Extensive forest abuts the west side of the river while a mix of residential use with related bridges and agricultural fields, some abandoned, border the east side. Wildlife was evident along this stretch including otter, herons, kingfisher and beaver activity.

Section Condition:

In this section, the river is afforded protection by the extensive forest on its west side (river right) and wildlife abounds. On the east side of the river, there is evidence of property owners are accessing the river but there is no public access. One private bridge has collapsed into the river and is trapping debris.

The issues along this stretch include bank erosion (evidenced by tree roots exposed), numerous patches of invasive Japanese knotweed, and the lack of vegetated buffer in a few places behind some of the residential properties and old agricultural fields. The invasive algae, Didymo may also be present.

Section C: Route 22 (2nd crossing, north of Harvey Mountain Road) to Route 22 (3rd crossing)...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat 	<ul style="list-style-type: none"> • River bank erosion • Japanese knotweed observed • Possible Didymo observation • Collapsed bridge in river • Mowed lawns down to the river 	<ul style="list-style-type: none"> • Investigate possibility of bank stabilization project • Investigate possibility of invasive species removal management • Investigate presence of Didymo. Talk with NY DEC • Investigate possibilities of downed bridge removal • Educate riverside land owners about the benefits of vegetated buffers



Collapsed bridge in river - photo by Dylan La Chance

Section D: Route NY-22 (3rd crossing), Austerlitz NY to Upper Hollow Road, Hillsdale NY

Surveyors: Mike Murphy & Brigid Glackin

Date of Survey: July 17, 2017

Distance: 1.3 miles

Elevation: 1051 – 991 feet

Tributaries: 1, Unnamed

Access Points: Informal access at Rte. 22 & Upper Hollow Rd Bridges

Associated Ecologically Sensitive Areas: Unknown

Section Overview:

The Green River continues to flow south and roughly parallel the east side of Route 22 for this entire section. On the west side of the river, at the beginning and end of this section, the river flows past a few residential properties and there is the occasional farm field (river right), but the remainder of this stretch is forested. Throughout this section there is extensive forest on the river's west side. Wildlife observed included ducks, kingfisher and red tailed hawk and evidence of beaver and deer activity.

The majority of river substrate is composed of gravel, cobbles and sand and the water was clear. The average depth is approximately one foot and less with multiple riffles and pools, with a slight current. Approximately half way down the river there is an approximate 600 foot meandering section of sand and gravel bars on both sides of the river.

Section Condition:

The issues along this section are similar to the previous sections and include numerous patches of invasive Japanese knotweed, bank erosion and a lack of vegetated buffer behind a couple of residential houses. Many Japanese knotweed patches were observed along the banks and gravel bars and brown algae was observed on the rocky substrate which may be invasive Didymo. Not all of the "knotweed" patches were mapped. The majority of the shoreline is forested and, as a result of bank erosion, many large blowdowns block the river. One section was severely eroded resulting in multiple trees down and in another stretch the trees down looked as if they had snapped off at about 1 – 2 feet high.

While property owners are likely accessing the river, there is no official public access and no evidence of recreational use of this area. The only way to informally access the river is at the bridges at beginning and end of this section. There were a few areas where the property owners mow their lawns to the river's edge.

Section D: Route NY-22 (3rd crossing), Austerlitz NY to Upper Hollow Road, Hillsdale NY...*continued*

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat 	<ul style="list-style-type: none"> • Japanese Knotweed observed • River bank erosion • Algae on river substrate • Mowed lawns down to river's edge 	<ul style="list-style-type: none"> • Investigate possibility of invasive species removal management • Investigate possibility of bank stabilization project • Educate riverside land owners about the benefits of vegetated buffers • Investigate presence of Didymo. Talk with NY DEC



An example of the bank erosion observed – photo by Mike Murphy

Section E: Upper Hollow Road to NY-71 (south of Nobletown Road), Hillsdale NY

Surveyor: Dylan LaChance

Date of Survey: July 19, 2017

Distance: 1.0 mile

Elevation: 991 – 942 feet

Tributaries: 1, Unnamed

Access Points: Along River Road/ Route 71 Bridge crossing

Associated Conservations Areas: Unknown

Section Overview:

This section of the river is in Hillsdale, New York. Here the river meanders primarily through forested land flowing quickly over a substrate of cobbles and boulders with a depth which varies from a few inches to about two feet deep with many riffles and pools.

Residential properties and one or two farm fields are scattered along the length of this section as the river is sandwiched between Route 22 and River Road. The river crosses under River Road twice before continuing south until it crosses Route 71 in Hillsdale where the section ends. At the northern end of this section upstream of the first River Road Bridge, a walking trail along the river was observed. Maybe fishermen and local residents are accessing the river here.

A couple of pipes (plastic; 18" diameter) that outfall to the river were noted. These pipes may be carrying stormwater from River Road to the Green River.



Two pipes observed on Section E which are possibly storm drain outfalls – photo by Dylan La Chance



**Section E: Upper Hollow Road to NY-71 (south of Nobletown Road), Hillsdale
 NY...continued**

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • Significant vegetated buffer along much of this section 	<ul style="list-style-type: none"> • Multiple patches of Japanese knotweed. • Algae on substrate, possibly Didymo • Lack of vegetated buffer where farm fields abut river and behind a couple of residential properties • 2, probable storm drain outfall pipes 	<ul style="list-style-type: none"> • Investigate possibility of invasive species removal management • Investigate presence of Didymo. Talk with NY DEC • Investigate any farm impacts to the river • Work with farm owner and NRCS to minimize any impact to the river



A view of the Green River along Section E - photo by Dylan La Chance

Section F: NY-71 (south of Nobletown Road) to Overlook Drive, Hillsdale NY

Surveyors: Dylan LaChance and Marcia Arland

Date of Survey: August 11, 2017
Distance 1.4 miles
Elevation: 942 – 895 feet
Tributaries: Cranse Creek & Westover Brook
Access Points: Informal access at NY-71 Bridge & Overlook Drive Bridge
Associated Ecologically Sensitive Areas: Unknown

Section Overview:

The Green River continues to flow south and south east through Hillsdale New York with a generally steep, forested hillside on the west bank and floodplain with agricultural fields and residential properties extending from the east bank. The river right is generally steep and the left bank abuts a floodplain with farms and mowed back yards. Several homes are along this section, and most homeowners are using the river in a friendly way. In the second, southern half of this section, Stony Ledge Road follows up above the river. The river's substrate continues to be cobbles and gravel and is mostly shallow with a quick current. A few deep pools, several gravel bars and downed trees are encountered. Various wildlife were observed including fish, kingfisher, raccoon and deer tracks.

Section Condition:

Typical of the earlier sections, several residential properties back up to the river and, in a few places, there is little easement between the river and the mowed back yards. In some instances, trees have been cleared from the riverbanks and the logs even used to prevent further erosion. The field on the east bank (river left) maintains a narrow buffer of about 25 feet.

Most of the river bottom is covered by a thin layer of a brown algae. It is not known if all the algae observed was *Didymo*, but this area has been posted as having invasive "rock snot"; Patches of the invasive Japanese knotweed are prevalent, as well as multiflora rose.

More trash (plastic, metal, and yard debris) was seen in this section compared to other sections. Old electrical wire is hanging across and the remnants are on the west bank. Some farm debris was observed on the banks and in the river.

**Section F: NY-71 (south of Nobletown Road) to Overlook Drive, Hillsdale
NY...continued**

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • Property owners appear to appreciate the river 	<ul style="list-style-type: none"> • Miscellaneous, small amounts of trash • Lack of vegetated buffer behind some residences • Stormwater runoff from roads entering river • Downed power line across the river (attached to a defunct junction box) • Cut trees on river's edge being used to prevent erosion • Multiple patches of Japanese knotweed and multiflora rose • Invasive Didymo possibly observed 	<ul style="list-style-type: none"> • Investigate possibility of invasive species removal management • Conduct a mini-river cleanup • Educate landowners about the benefits of vegetated buffers and appropriate methods to handle yard waste • Determine if powerline can and should be removed



Section G: Overlook Drive, Hillsdale NY to Route 71 (Green River Valley Road), Alford MA

Surveyors: Suzanne H. Werner and Mary King

Date of Survey June 11, 2017

Distance: 2.1 miles

Elevation: 895 – 856 feet

Tributaries: 4, unnamed tributaries

Access Points: Informal access at Overlook Drive and the Route 71 Bridges

Associated Ecologically Sensitive Areas: River Corridor –Massachusetts section about 5-600 feet wide (Massachusetts Natural Heritage Program)

Section Overview:

The Green River continues to meander through the floodplain past a mix of residential properties, agricultural fields (most of which are in disuse) and forest. It leaves New York State and enters Massachusetts at about a mile into this section. Much of what is seen from the river is just forest. The river's clear water flows over a substrate comprised of sand, gravel and cobbles with a fast moving current and variable depths ranging from just a few inches at the riffles to deeper pools of three feet or more. Gravel/sand bars are found along its length with multiple blockages due to fallen trees. Recent, new beaver activity was reported by one of the Surveyors (who is a riverside property owner). The beaver dam is now 3 – 4ft high and is ponding the water back towards the Overlook Drive Bridge.

Section Condition:

The concerns along this section are similar to the other sections. There are extensive patches of knotweed on the river banks and even on the gravel bars, evidence of bank erosion as well as anecdotal information about the erosive nature of the river from property owners. In a couple of places there is a lack of vegetated buffers behind the residential properties and agricultural fields. Undercut banks and bank erosion is evident in several locations with some more severe erosion occurring downstream of the Overlook Drive bridge. Trees have fallen across the river partially or wholly blocking passage.

The Green River is an erosive river and downed trees periodically create new channels. Following a storm event in about 2006, the river started to follow a new channel which concerned property owners as the erosive force was eating away at their land and property was in imminent danger of being affected. Property owners contacted the United States Fish and Wildlife Service worked with them to have the Green River redirected back into the original channel. A contractor removed the gravel deposits from the original channel and created a berm to prevent the river continuing to use the new channel. According to a property owner, the intent was that the berm would be low enough that, in higher water, the river flow would use both channels and the energy

Section G: Overlook Drive, Hillsdale NY to Route 71 (Green River Valley Road), Alford MA...continued

of the water be dispersed between the two channels. However, the contractor made the berm too high so that the river rarely can overflow into this secondary channel. This means the entire erosive force stays within the main channel. The property owners now have a concern that this is increasing the erosion downstream of this site and impacting their property.

There is no public access to the river. However, it is obvious that property owners enjoy and appreciate the river. At least one property owner is attempting to control the invasion of Japanese knotweed by repeatedly cutting and hand pulling. Only minor amounts of trash were noted. People have in the past used the road bridges to access the river for fishing. The only observed river access were at the beginning and end of this section. A few riverside lawns were mowed down to the river’s edge.

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • NHESP Priority Habitat for Rare species (corridor along the Green River in the Massachusetts’ portion of this section) 	<ul style="list-style-type: none"> • Several places where trees are down across the river • Invasive Japanese knotweed observed. • Lawns mowed down to river’s edge. • Bank erosion • Property owner concerned that restoration of main channel following storm is now increasing erosion. 	<ul style="list-style-type: none"> • Investigate possibility of invasive species removal management • Investigate property owner concern and whether lowering berm where restoration project occurred would be advisable • Educate riverside land owners about the benefits of vegetated buffers • Investigate possibilities of educating landowners about the importance of woody debris in the river, in the event they desire to open a channel

Section H: Route 71 (Green River Valley Road) Alford to Boice Road, Egremont MA

Surveyors: Barbara Bockbrader, Cia Elkin, Kai Reed

Survey Date: July 30, 2017

Distance: 2.2 miles

Elevation: 856 – 773 feet

Tributaries: 2, unnamed tributaries

Access Points: Bridges at Route 71, Rowe Rd. & Boice Rd. crossings

Associated Ecologically Sensitive Areas: River Corridor – almost the entire section about 600 feet wide (Massachusetts Natural Heritage Program)

Conserved Properties: Alford Wildlife Sanctuary (Town of Alford)
North Egremont Wildlife Conservation Easement (Egremont Land Trust)⁵

Section Overview:

The Green River continues to flow southeast through Alford past the Alford Wildlife Sanctuary (4.5 acres) and into Egremont, Massachusetts where it passes through the North Egremont Wildlife Conservation Easement (22 acres). The land use around the river is a mix of forested lands and agricultural fields but what you see from the river is predominantly forest. The river depth fluctuates from more than 3 feet to less than one foot, with a fast current and numerous riffles and pools. The substrate also varies from gravel and cobbles to boulders and sand. Overhanging and aquatic vegetation (none invasive) is sparse. There is little vegetation overhanging the river and very little aquatic vegetation (none invasive).

Section Condition:

The stream and vegetated habitat, which is mostly forested, is healthy and a variety of birds were seen and heard including mergansers, vireos, sparrows, kingfisher and even indigo buntings. As with other sections fallen trees partially or fully block the area in several locations. The fallen trees create deep pools and refuge areas for fish. There was evidence of old beaver activity and deer tracks.

There are just a few locations where the agricultural fields are mowed to the river's edge. Various invasive plants were observed including Japanese knotweed (some extensive patches), Norway maple, bittersweet, multiflora rose and Japanese barberry. Minor amounts of eroded river banks were observed. There isn't any public access to the river but there is evidence of people using the river such as a rope swing at a deep pool location

⁵ North Egremont Wildlife Conservation Easement (22 Acres) For more information contact: Egremont Land Trust <http://www.egremontlandtrust.org>

**Section H: Route 71 (Green River Valley Road) Alford to Boice Road, Egremont
MA...continued**

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • Alford Wildlife Sanctuary • Priority Habitat along Green River Corridor (beginning of section and 2nd mile) 	<ul style="list-style-type: none"> • Multiple blockages due to fallen trees • Japanese Knotweed and other invasive plants observed • Minor amounts of river bank erosion • Farm Fields mowed to river's edge in a few locations 	<ul style="list-style-type: none"> • Investigate possibility of invasive species removal management • Educate riverside land owners about the benefits of vegetated buffers • Investigate possibilities of educating landowners about the importance of woody debris in the river, in the event they desire to open a channel • Work with Farmer and NCRS to improve vegetated buffers along field edge



Surveying the Green River (Section G) photo taken by Suzanne Werner

Section I: Boice Road, Alford to Pumpkin Hollow Road, Great Barrington, MA

Surveyors: Marcia Arland, Dylan LaChance

Date of Survey: July 23 2017
Distance: 1.7 miles
Elevation: 773 – 734 feet
Tributaries: 1, Unnamed
Access Points: Informal access at road bridges
Associated Ecologically Sensitive Areas: River Corridor – 0.8 miles upstream of Pumpkin Hollow Road section about 600 feet wide (Massachusetts Natural Heritage Program)

Section Overview:

In this section, the Green River meanders south east roughly parallel to Egremont Plain Road, at a distance of 500 – 1000 feet. The mix of land use includes agricultural fields, forest and a few residential properties. The vegetated buffer is mostly forested on the east bank (extensively in places) with the agricultural fields and residential properties on the western side fronting Egremont Plain Road. The river has widened and ranges from 30 – 50 feet. The water is clear with a slight current and flows over a substrate consisting mostly of gravel and cobbles but also has areas of boulders and sand with silt and organic debris. Gravel bars are numerous. There are major sand and gravel beds in an old oxbow river meander in the middle section of this section. There is a mix of riffles and pools with occasional braiding. The river depth ranged from about a foot to five feet deep.

Section Condition:

There are few concerns along this section and they are similar to other sections. While most of the agricultural fields and residential properties maintain a forested buffer of 40 – 50 feet, there are a few places where fields or lawn are mowed up to the river's edge. Several significant and small patches of the invasive Japanese knotweed were observed as well as invasive multiflora rose. In the river a brown algae, which is possibly *Didymo* covers the rocks along the whole length. Some metal car parts were observed on the bank and buried in the gravel bar as well as a tire in the river. No pipes were observed entering the river. Towards the end of the section some of the banks that are about 5ft high are actively eroding and collapsing at a mowed field edge. These banks may provide nesting habitat for kingfisher or bank swallows. Deer, ducks and heron were observed. Fallen trees partially or fully blocking the river were observed. These enhance the wildlife habitat.

Section I: Boice Road, Alford to Pumpkin Hollow Road, Great Barrington, MA...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • Vegetated buffer intact along much of this section 	<ul style="list-style-type: none"> • Algae on substrate, possibly Didymo • Trash noted: metal pieces of old cars found on riverbank • Japanese knotweed & multiflora rose observed. • Lack of vegetated buffer in a few locations, bank erosion and collapsed field edge • Downed trees block river channel in multiple areas 	<ul style="list-style-type: none"> • Investigate possibility of invasive species removal management • Investigate presence of Didymo. Talk with MA Div. of Fish & Wildlife • Investigate possibility of removing car parts and other trash • Educate property owners about the importance of vegetated buffers • Investigate possibility of educating landowners about the importance of woody debris in the river, in the event they desire to open a channel



Marcia Arland, Stream Team member, investigating the eroded banks
 Photo taken by Dylan La Chance

Section J: Pumpkin Hollow Road to Seekonk Cross Road, Great Barrington MA

Surveyors: Alison Dixon and Daniel Rogacki

Date of Survey: November 4, 2017
Distance: 1.4 miles
Elevation: 734 – 715 feet
Tributaries: 1, Unnamed
Access Points: Informal access at road bridges
Associated Ecologically Sensitive Areas: River Corridor – Entire section about 1000-1500 feet wide (Massachusetts Natural Heritage Program)

Section Overview:

This stretch of river was assessed from canoes and using Google Earth imagery. The Green River flows through the flood plain in primarily an eastern direction. Forest land abuts the river on both sides for most of this section buffering the river from the agricultural fields that extend beyond. The river flows past a couple of residential properties, agricultural fields and an airport. Planes are heard as you near Seekonk Cross Road.

The river continues to have a gravelly substrate and a quick current and, while mostly shallow, there are deep pools (in places 5ft deep) created by downed trees encountered all along the way. An unidentified aquatic plant is evident in patches throughout the stretch. Gravel bars are numerous and some braiding of the river occurs. No beaver activity was seen, but a trout was observed near the Seekonk Cross Road Bridge and wildlife tracks and scat seen on the abundant gravel bars and downed trees. People are accessing the river evidenced by fire pits and informal, private paths to the river.

Section Condition:

This stretch of the Green River has few concerns. In a few places, the vegetated buffer is narrow to non-existent along farm field edges and residential properties. Here there are areas of bank erosion. There is also bank erosion where there is a significant forested buffer. Japanese knotweed is evident but there are only a couple of sizeable patches and several very small patches on gravel bars. The river cannot be easily navigated due to trees down blocking the river entirely in multiple locations. The aquatic vegetation that was observed has not been identified and as it is evident throughout this stretch it would make sense



Pumpkin Hollow Road Bridge - photo by Alison Dixon (HVA staff)



Section J - A view of the Green River - photo by Alison Dixon (HVA staff)

Section J: Pumpkin Hollow Road to Seekonk Cross Road, Great Barrington MA...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat 	<ul style="list-style-type: none"> • Lack of vegetated buffer (behind some residential and agricultural fields) • Some areas of bank erosion • Multiple downed trees blocking passage • Several patches of Japanese knotweed (most are small). Invasive barberry also seen in understory of forested buffer • Unidentified aquatic plant common along the section 	<ul style="list-style-type: none"> • Educate property owners about importance of vegetated buffers and work to improve buffer • Investigate possibility of invasive species removal management • Work with Farmer and NRCS to improve vegetated buffer along field edge • Investigate possibility of educating landowners about the importance of woody debris in the river, in the event they desire to open a channel • Revisit and identify the aquatic plant observed to determine if it is a concern



Section J had multiple trees down making it an obstacle course to paddle by canoe – photo taken by Alison Dixon

Section K: Seekonk Cross Road to Hurlburt Road, Great Barrington MA

Surveyors: Carol Noble, Dylan LaChance

Date of Survey: July 6, 2017

Distance: 1.5 miles

Elevation: 715 – 697 feet

Tributaries: Seekonk Brook, Long Pond Brook and outflow.

Access Points: Informal access at road bridges

Associated Ecologically Sensitive Areas: River Corridor – Entire section about 1000-1500 feet wide (Massachusetts Natural Heritage Program)

Section Overview:

In this section, the Green River meanders north around a large, forested hill and then turns back southward again as it flows past agricultural and forested lands. Gravel and sand bars are located throughout this section with a moderate amount of woody material in the river and sparse overhanging vegetation. The river’s depth ranges from less than a foot to more than 4 feet deep, with numerous riffles and pools.

Section Condition:

The Green River has a significant vegetated buffer consisting of forest and shrubs for all of this section except along the field edges at the very beginning and end of the section. Bank erosion is evident along these field edges. Even the forested banks were eroded in places resulting in trees falling into the river, partially or fully blocking the river channel.

There is no public access to the river along this section. However, just downstream of the Seekonk Cross Road bridge is an extensive gravel bar and a popular, but unofficial, swimming hole. The area is posted “No Trespassing.”

Stormwater runoff likely enters the river at Seekonk Cross Road and the Hurlburt Road Bridges as well as where the river flows alongside Seekonk Cross Road.

While Japanese knotweed was observed – it seems to be less prevalent and less extensive along this stretch than it has been in some of the earlier sections.

There were a few spots where stagnant pools had an oily look or were filled with greyish water and algae. One stagnant pool had a sewage-like odor.

Section K: Seekonk Cross Road to Hurlburt Road, Great Barrington MA...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • Good vegetated buffer for most of the section • Unofficial swimming hole at Seekonk Cross Road 	<ul style="list-style-type: none"> • Multiple blowdowns in river • Lack of vegetated buffer along field edge • Stagnant pool with sewage-like smell • Oily patches observed • Small patches of Japanese knotweed observed • Stormwater runoff from Seekonk Cross Road 	<ul style="list-style-type: none"> • Test the water quality in area of sewage smell • Work with Farmer and NRCS to improve vegetated buffer along field edge • Develop a management plan for the Japanese knotweed • Investigate possibility of educating landowners about the importance of woody debris in the river, in the event they desire to open a channel • Determine if there's impact from stormwater runoff entering river, work to minimize



Carol Noble, Stream Team member, survey the Green River (Section K)
Photo taken by Dylan La Chance

Section L: Hurlburt Road to Route 23/41 (Maple Avenue)

Surveyors: Marcia Arland, Dylan LaChance

Date of Survey: July 21 2017

Distance: 1.5 miles

Elevation: 697 – 679 feet

Tributaries: None

Access Points: Hurlburt Road & Rte. 23/41

Associated Ecologically Sensitive Areas: River Corridor – Entire section about 6-700 feet wide (Massachusetts Natural Heritage Program)

Section Overview:

The section between the Hurlburt Bridge and Route 23 Bridge is a beautiful, relatively wild, and flat stretch of the Green River. While the predominant land use is agricultural, for the most part, the forested buffer (100 feet +/-) shields the river from the fields. In the southern part of the section this buffer narrows and fields as well as a couple of houses are more visible. A pump station and associated storage tanks is encountered (river left) a third of the way along the section. Below the station is a low, manmade dam. The river flows relatively straight for the first 0.4 miles and then meanders for another half mile before flowing towards the Route 23/41 bridge.

The clear river water flows with a moderate current over a gravel and cobble substrate which changes to a sandy bottom at the end of the section. The water depth ranges from a few inches in the riffles to deep pools of 3 – 6 feet. Fallen trees are encountered along the entire section but are more prevalent at either end of this section. Overhanging and aquatic vegetation is sparse along the entire section.

Section Condition:

Bank erosion continues to be evident along this section as well as a few patches of invasive Japanese knotweed.

There is no official public access on this section. However, the pump station area is regularly accessed by “locals” and is a favorite dog and human swimming area. The man-made dam helps pond the water to increase depth for swimming. Today, this section was trash-free, and had very little signs of human use.

Beavers are active along this section with recent and older evidence observed. Fresh cut vegetation was evident at the beaver dam and older beaver chews were seen inland in a wooded area. The eroded banks provided nesting habitat for a pair of belted kingfishers. The river appears to be healthy fish habitat with numerous minnows observed.

The water in the Green River continues to be clear and appears to be very good quality. However, a drainage area or “canal” full of algae and water that looked grey could be negatively impacting the river and should be investigated to determine any impacts.

Section L: Hurlburt Road to Route 23/41 (Maple Avenue)...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • Evidence of people and dogs accessing the river at the pump house 	<ul style="list-style-type: none"> • Bank erosion. • Japanese knotweed – a few patches observed • “canal” with greyish water and full of algae 	<ul style="list-style-type: none"> • Educate landowners about the importance of vegetated buffers • Investigate possibility of bank stabilization project • Determine source and nature of discharge into “canal” • Develop an invasive plant removal plan to manage the knotweed • Work with Farmer and NRCS to maintain, and improve where necessary, the vegetated buffer along farm field edges • Determine if public access is possible and desired



“Canal” with greyish water and full of algae – photo taken by Dylan La Chance

Section M: Route 23/41 to Wyantenuck Golf Course Bridge

Surveyors: Dennis Regan & Dylan LaChance

Date of Survey: June 29, 2017

Distance: 1 mile

Elevation: 679 – 672 feet

Tributaries: None

Access Points: Informal access at Rte. 23/41 Bridge

Associated Ecologically Sensitive Areas: River Corridor – Entire section about 1000 feet wide (Massachusetts Natural Heritage Program)

Section Overview:

In this section, the river flows through agricultural land buffered by forest and shrub vegetation of various widths (40 – 300 feet). Beyond the agricultural fields, the river enters a forested area after which it begins to flow through the golf course. The water is clear, flowing over a gravel and cobble substrate, with a depth of approximately 2 feet deep with some deeper pools throughout. Some locations had algae covering the rocks. The overhanging and aquatic vegetation is sparse on this entire section. There is a moderate amount of woody material and undercut banks.

Section Condition:

At the beginning of this section, the river up and downstream of the Rte. 23/41 bridge has become a community swimming hole. The property owner complains of trash being left at the swimming hole.

Where the river has meandered into the agricultural field, the vegetated buffer is non-existent and the corn field is eroding into the river. The river has likely eroded the original existing buffer away.

Invasive Japanese knotweed patches were observed in multiple locations – even in the corn field. The algae observed on the rocks could possibly be “Didymo.”



Marcia Arland, Stream Team member surveying the Green River (Section L) – photo taken by Dylan LaChance

Section M: Route 23/41 to Wyantenuck Golf Course Bridge...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Good wildlife/fish habitat • Popular swimming location 	<ul style="list-style-type: none"> • Trash being left at swimming hole • Algae on substrate could be Didymo • Active bank erosion at farm field edge • Japanese knotweed patches observed – even growing into the corn field 	<ul style="list-style-type: none"> • Schedule a trash and debris cleanup of surround area at swimming hole. • Investigate possibility of bank stabilization project. • Investigate presence of Didymo. Talk with MA Fish & Wildlife • Work with Farmer and NRCS to develop better vegetated buffers



Up and down the Green River is evidence of people enjoying and using the river (Section M) photo taken by Dylan La Chance

Section N: Wyantenuck Golf Course Bridge to Railroad Bridge

Surveyors: Dennis Regan, Dylan LaChance

Date of Survey: June 29 2017

Distance: 0.5 miles

Elevation: 672 – 668 feet

Tributaries: None

Access Points: No public access

Associated Ecologically Sensitive Areas: River Corridor – Entire section about 1000 feet wide (Massachusetts Natural Heritage Program)

Section Overview:

This section begins within the Wyantenuck Golf Course. The river meanders its way through the golf course and under a pair of footbridges before entering a forested area where it passes an active farm field on the west bank (river right). The river’s depth ranges between 1 – 3 feet deep with numerous pools some deep (3 – 5 feet) where there is bank erosion. Mowed lawn is the primary vegetative cover on both banks through the golf course. There is no overhanging vegetation and the woody material in the stream is sparse. No aquatic vegetation in the stream was observed. Bird houses are placed along the river in the golf course. These are probably used by tree swallows and wrens. Animal tracks, trout and minnows were observed. At least one trout was about 8 inches.

Section Condition:

Typical of most golf courses, the greens are mowed to the river’s edge and many golf balls were seen in the river. A lack of vegetated buffer is also evident along the farm field (river right) where there is active bank erosion for about 100 yards on the river bend. In the river, near a drainage pipe from the golf course property there was a thick mat of aquatic vegetation.



A view of the golf course from the private bridge used to access Section N – photo taken by Dylan La Chance

Section N: Wyantenuck Golf Course Bridge to Railroad Bridge...continued

Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none"> • Country Club Managers care about the river and strive to limit impact to the river • The Country Club mows a large field just once a year to keep the vegetation down and to attract birds. Multiple bird houses evident 	<ul style="list-style-type: none"> • Golf course greens mowed to river's edge • Lack of vegetated buffer along farm field • Bank erosion along farm field edge • Near drainage pipe from golf course – more aquatic vegetation observed in the river 	<ul style="list-style-type: none"> • Discuss with Country Club Managers additional ways they can reduce impact to the river • Determine if drainage pipe is delivering nutrients to the river • Investigate possibility of bank stabilization project



Brigid Glackin, Stream Team member, at the edge of the Housatonic River near the confluence with the Green River – photo taken by Mike Murphy

Section O: Railroad Bridge to Confluence with Housatonic River

Surveyors: Brigid Glackin, Michael Murphy

Date of Survey: August 11 2017

Distance: 0.72 miles

Elevation: 668 – 660 feet

Tributaries: None

Access Points: Informal access from Rte. 7 Bridge and from the Housatonic River

Associated Ecologically Sensitive Areas: River corridor (about \leq 300 feet wide)

Section Overview:

In this section, the Green River flows south between railroad tracks and Route 7 before veering east after the Route 7 bridge to join with the Housatonic River. Overgrown and cultivated fields and a tree nursery mostly buffered by forest are the primary land uses. The river comes close to one commercial property's parking area on Route 7.

The clear water of the Green River meanders with a slight current with riffles just a couple of inches deep to four feet deep pools. Abundant vegetation overhangs the river and there are fallen trees creating blockage. Tracks of deer, raccoons, fox and coyote are evidence of their using the river corridor. Animal dens were also seen. A multitude of ducks, geese, herons and other birds were observed.

Section Condition:

Two issues, bank erosion and the lack or narrowness of vegetated buffers, continue to be a concern on this section as in others. Stormwater runoff from Route 7 and from the commercial property is likely impacting the river. Finally, herbicide appears to be used to keep vegetation down around the trees in the "nursery" and this may be impacting the river.

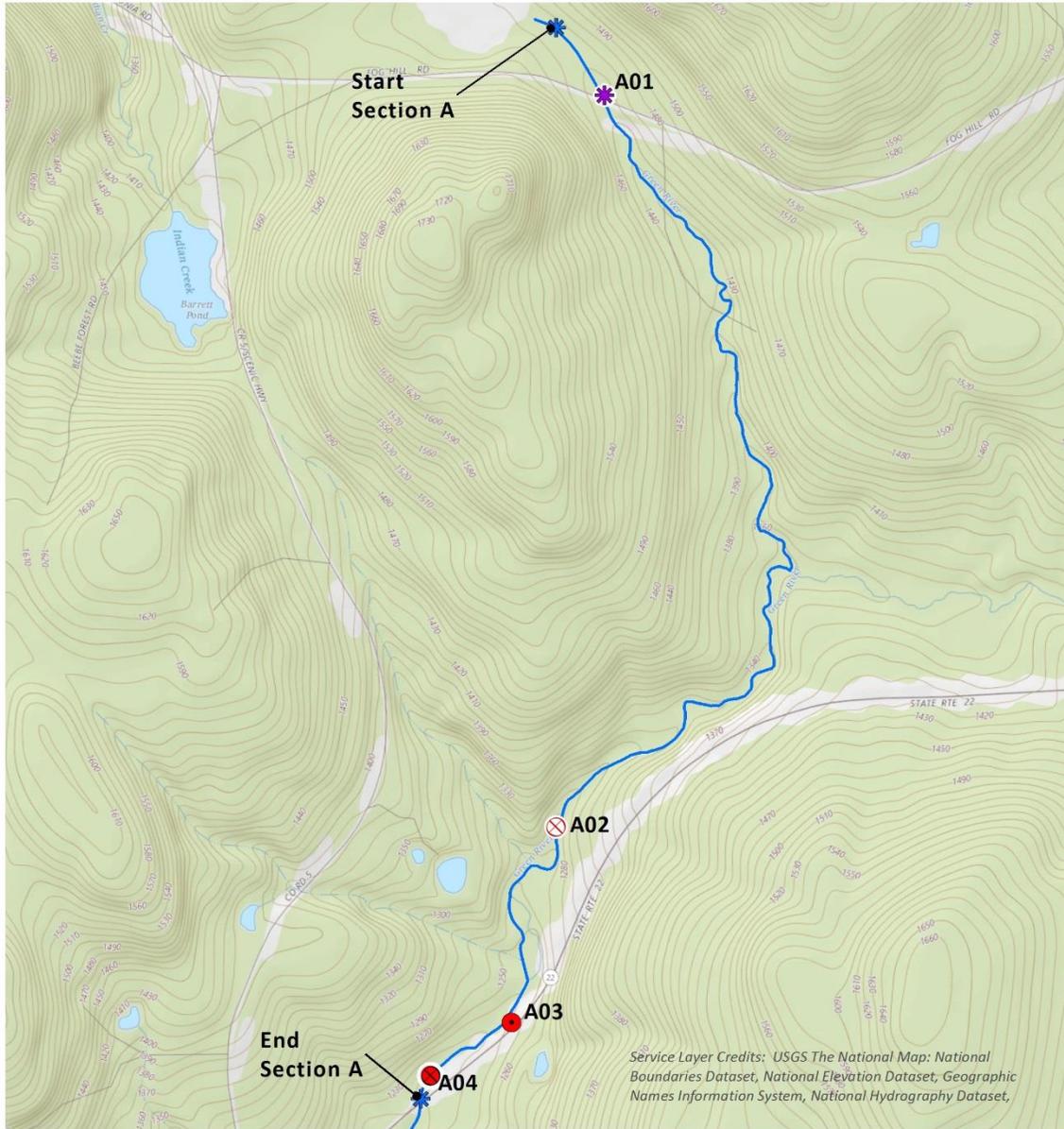
Natural Resources and Assets	Concerns	Recommended Actions
<ul style="list-style-type: none">• Good wildlife/fish habitat	<ul style="list-style-type: none">• Bank erosion• Narrow vegetated buffer along farm field edge• Stormwater runoff from parking area of commercial property• Possible herbicide use on tree nursery near river	<ul style="list-style-type: none">• Investigate possibility of bank stabilization project• Work with farmers and NRCS to develop better vegetated buffers• Determine if herbicide use is impacting the river• Work with business owners of commercial property to reduce stormwater impact to the river

IV. Green River Section Maps and Feature Data

The following are feature descriptions used in the section maps and feature data tables.

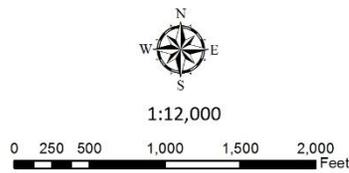
- Access** Includes locations that are being used to access the river; pedestrian trails and car-top boat accesses (both recognized and ones that have seen traditional use), informal fishing and swimming accesses. HVA does not intend to construe these locations as acceptable canoe/kayak put-in sites. Note: main bridges are not indicated as “Access” although, they are often used to access the river.
- Confluence** Marks the location of a tributary entering the Housatonic River that is not visible on the map.
- Historic** Denotes an identified feature that has historical significance.
- Impediment** Includes any physical structure, man-made or natural, which creates a partial or full blockage of the river channel; manmade dams, beaver dams, fallen trees, *culverts, pipes across the river that are at or below the water’s surface and mid-channel bridge abutments. *Only stream crossings that impede aquatic connectivity are included here.
- Invasives** Includes plants considered invasive in Massachusetts. These include Japanese knotweed, common reed, purple loosestrife as well as aquatic invasive plant and animal species (zebra mussels) and Didymo
- Land Impact** Significant land use that may impact the river’s health: For example, gravel pit operations, scrap yard businesses, and monitoring wells
- Pipe** Includes all pipes (and hoses) observed that (a) outfall to the river (b) cross the river or (c) pipes or hoses that may be extracting water. Pipes that outfall to the river are predominantly storm drain outfalls but include outfalls to the river with an unknown origin. Pipes that cross the river above the water level in normal flow and do not impede flow or navigation or cross the river bottom are also included.
- Stream Impact** Any activity or structure that is likely to *constrict* the river or *impact* the *water quality or volume*. This includes structures that are channeling the river, such as riprapped banks and retaining walls and conditions such as lack of vegetated buffers (vegetation along the river banks) and bank erosion.
- Trash** While miscellaneous small amounts of trash were noted in many locations, this feature is used to indicate a dumpsite or heavily trashed area that requires more immediate attention.
- Wetland Impact** Any impact to a wetland in the riparian buffer
- Wildlife** Denotes any area that has particular wildlife significance

Green River Section A



Legend

-  Impediment
-  Invasives
-  Pipe
-  Stream Impact

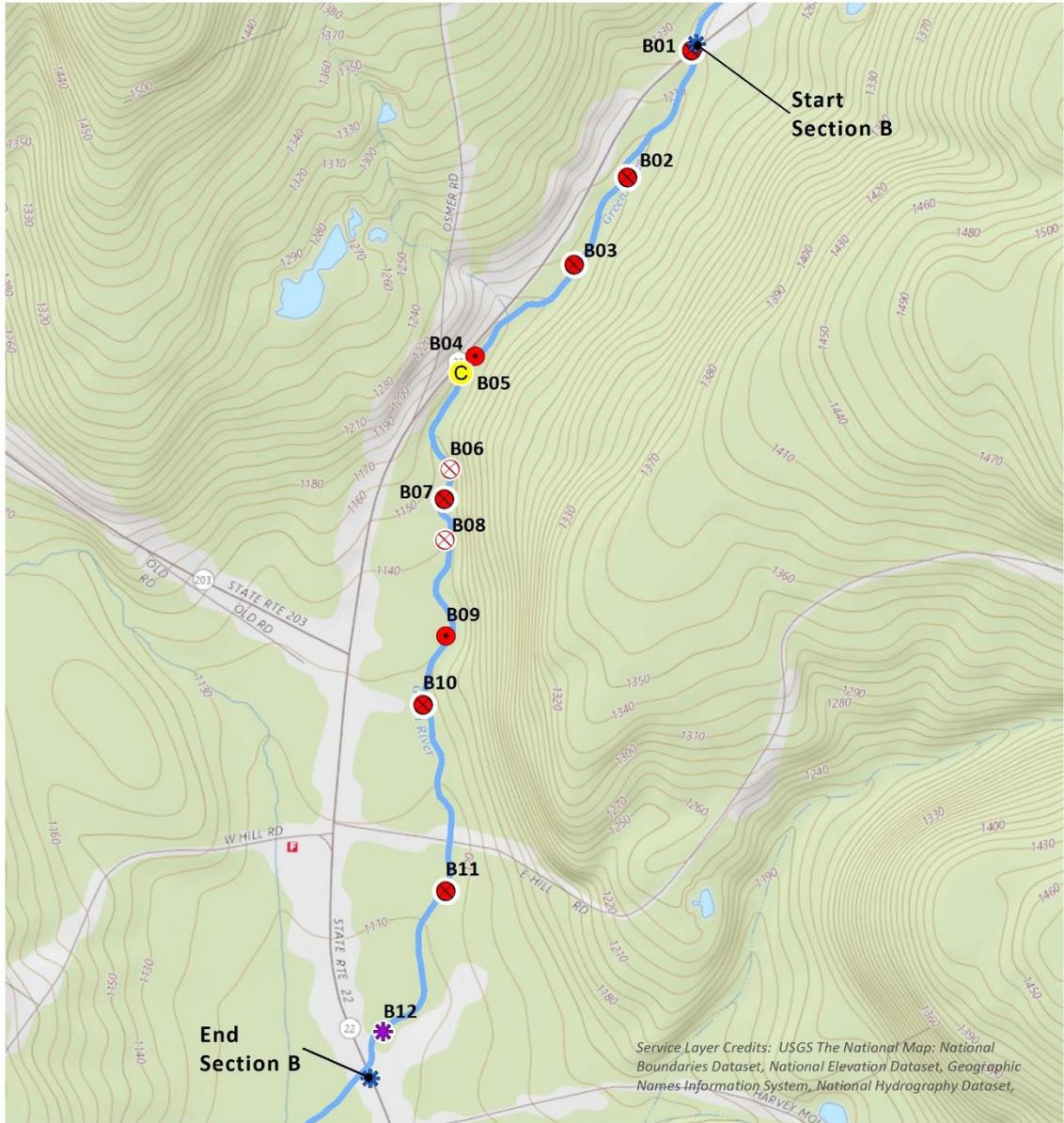


Map Author:
Stacy Deming, GISP
GIS Manager
Housatonic Valley Association

Section A: Fog Hill Rd to Route 22 Crossing (1st Crossing, north of Osmer Road) in Austerlitz, NY

CODE	GPS COORDINATES		FEATURE	NOTES
A00	42.340783	-73.462551	Beginning of Section A	Fog Hill Road crossing
A01	42.340837	-73.462525	Invasives	Upstream of crossing patch of Phragmites
A02	42.326719	-73.463347	Impediment	Trees down catching woody debris (Multiple locations)
A03	42.322915	-73.464376	Pipe	Probable storm drain outfall (Approx. coordinates obtained from Google maps)
A04	42.321531	-73.466738	Stream Impact	river right: Bank erosion on bend upstream of Rte. 22 bridge

Green River Section B



Legend

- Pipe
- ⊗ Impediment
- Stream Impact
- ✱ Invasives
- Confluence



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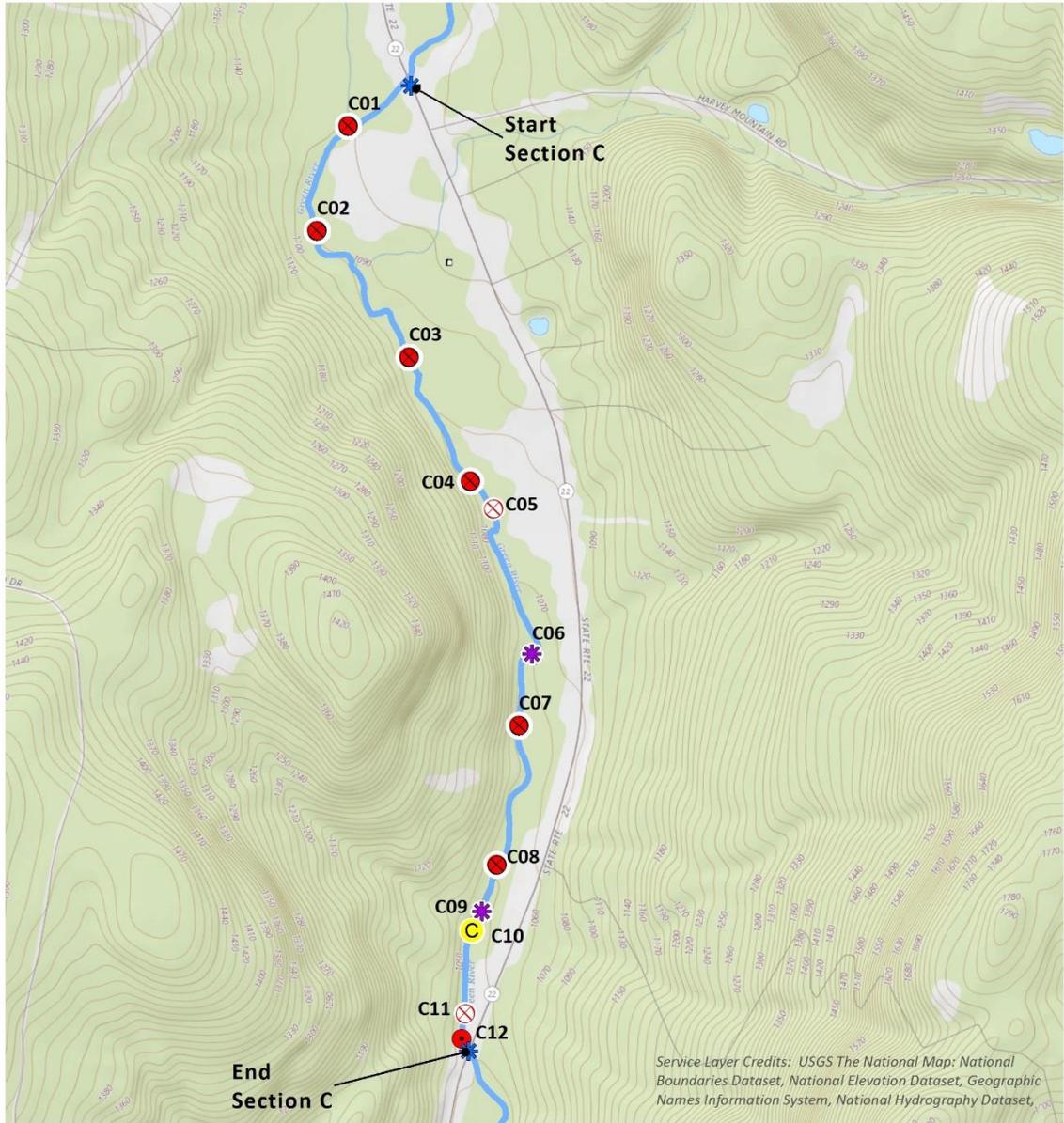


Map Author:
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Housatonic Valley Association

Section B: Route 22 (1st crossing, north of Osmer Road) to Route 22 (2nd crossing, north of Harvey Mountain Road) Austerlitz, NY

CODE	GPS COORDINATES		FEATURE	NOTES
B00	42.321413	-73.466771	Beginning of Section B	Rte. 22 Road Crossing - North of Osmer Road (Rte. 5)
B01	42.321305	-73.466782	Stream Impact	Rte. 22 Road Crossing bridge - in some disrepair / constricts flow C810500 sign on bridge
B02	42.319440	-73.467978	Stream Impact	Residential lawn to edge of river (river left)
B03	42.318154	-73.468989	Stream Impact	Residential lawn to edge of river (river right)
B04	42.316780	-73.470880	Pipe	Rte. 22 - Storm drain outfall (1 - 2ft pipe) No flow, damp, no odor
B05	42.316532	-73.471143	Confluence	Possible tributary - dry
B06	42.315140	-73.471320	Impediment	Blockage (tree down?)
B07	42.314700	-73.471420	Stream Impact	Lack of vegetated buffer: Mowing up to the bank
B08	42.314110	-73.471390	Impediment	Downed tree blocking river; trapped debris
B09	42.312700	-73.471320	Pipe	Water extraction may be occurring; hose in river goes to pump near camper
B10	42.311700	-73.471740	Stream Impact	Lack of vegetated buffer: Mowing up to the bank
B11	42.309000	-73.471220	Stream Impact	Mowed edge on both sides of the river;
B12	42.306934	-73.472376	Invasives	Narrow buffer with patches of Japanese knotweed and other invasive plants

Green River Section C



Legend

- Pipe
- ⊗ Impediment
- Stream Impact
- ✳ Invasives
- Confluence



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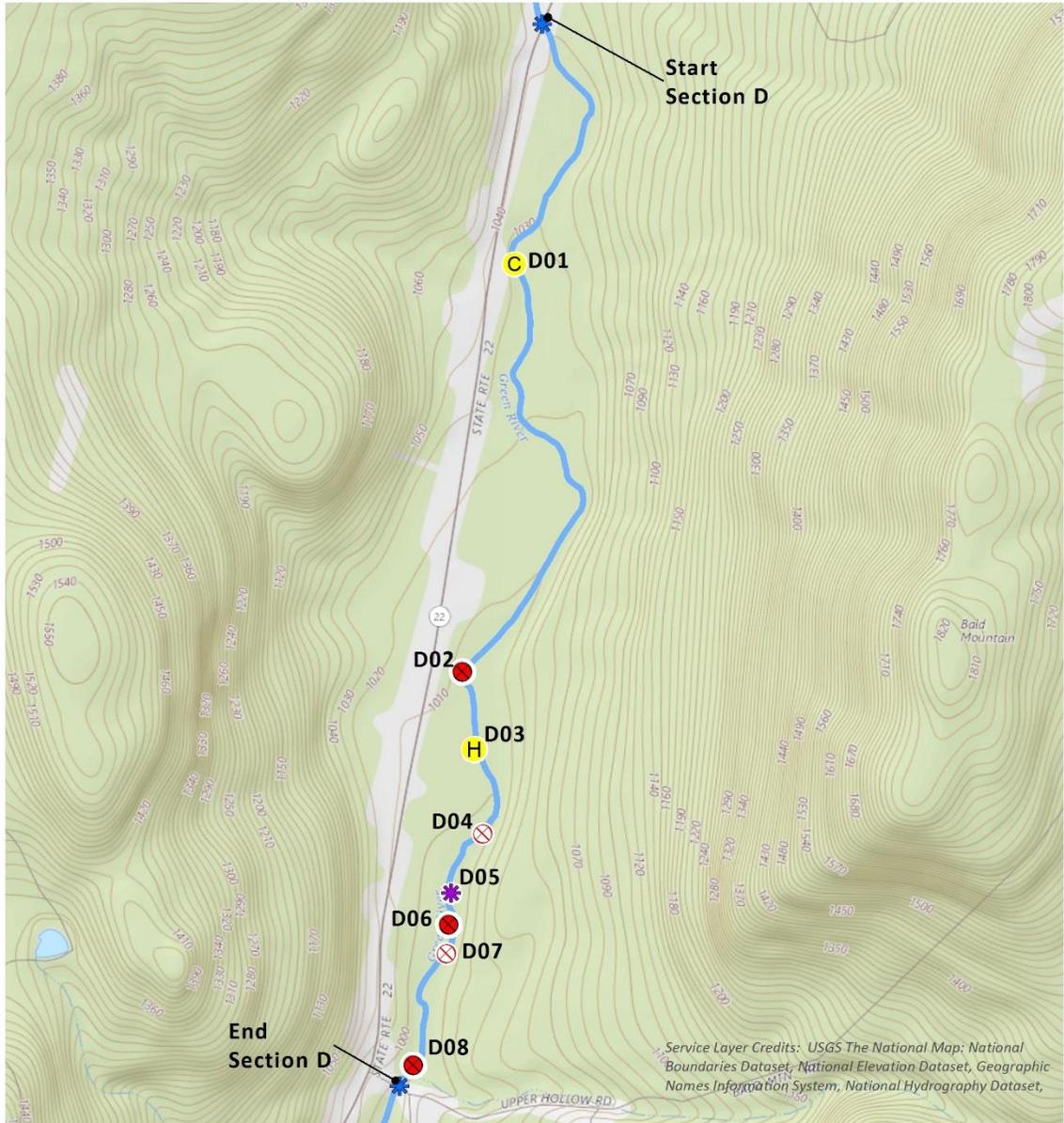


Map Author:
Stacy Deming, GISP
GIS Manager
Housatonic Valley Association

**Section C: Route 22 (2nd crossing, north of Harvey Mountain Road)
to Route 22 (3rd crossing)**

CODE	GPS COORDINATES		FEATURE	NOTES
C00	42.306253	-73.472603	Beginning of Section C	Rte. 22 Road Crossing - North of Harvey Mountain Road
C01	42.305450	-73.474220	Stream Impact	River left: Mowed field up to river's edge (for about 600 feet)
C02	42.303408	-73.474980	Stream Impact	River left: Mowed field up to river's edge (for about 750 feet)
C03	42.301000	-73.472500	Stream Impact	Algae - thick mats on bottom BRIGHT green appearance/ looks similar to reddish brown algae
C04	42.288670	-73.470720	Stream Impact	River left: Mowed field up to river's edge (for about 750 feet)
C05	42.298100	-73.470200	Impediment	Collapsed bridge has trapped debris completely blocking stream
C06	42.295300	-73.469100	Invasives	Japanese knotweed patch (just upstream of pedestrian bridge)
C07	42.293900	-73.469400	Stream Impact	Lack of vegetated buffer; mowing to bank (Private bridge for driveway)
C08	42.291200	-73.469900	Stream Impact	large algae growth atop water - reddish brown appearance
C09	42.290100	-73.470400	Invasives	Japanese knotweed patch (large, river left and upstream river right)
C10	42.289900	-73.470500	Confluence	Confluence with small unnamed tributary
C11	42.288100	-73.470700	Impediment	Active beaver dam
C12	42.287799	-73.470698	Pipe	2, 4in PVC pipes protruding from bank right, dripping; some algae/sediment in pipe

Green River Section D



Legend

- Pipe
- Stream Impact
- Confluence
- ⊗ Impediment
- ★ Invasives



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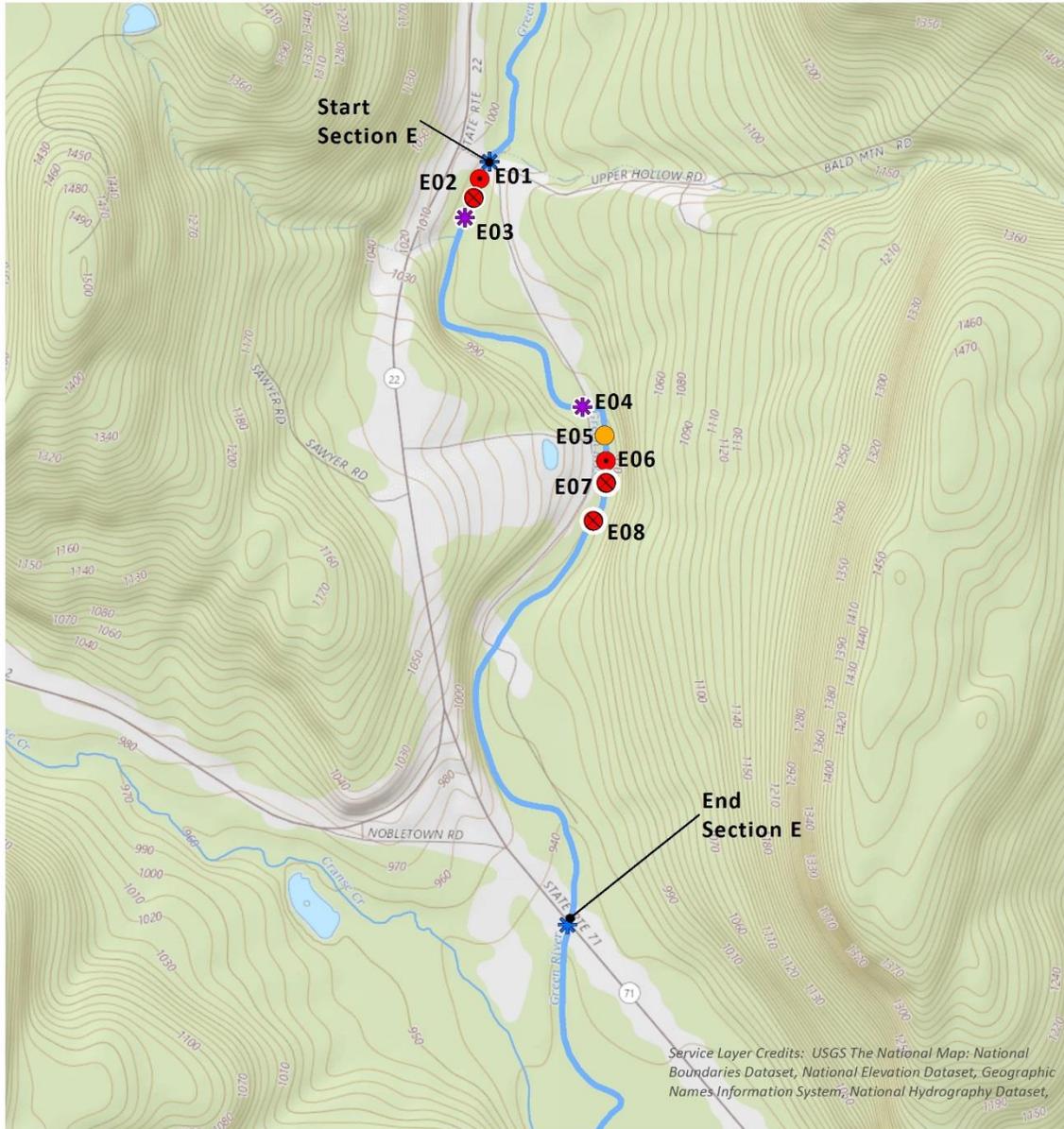


Map Author:
Stacy Deming, GISP
GIS Manager
Housatonic Valley Association

**Section D: Route NY-22, Austerlitz NY (3rd crossing,) to
Upper Hollow Road, Hillsdale NY**

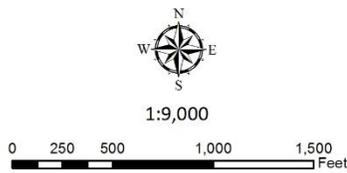
CODE	GPS COORDINATES		FEATURE	NOTES
D00	42.287574	-73.470514	Beginning of Section D	Route 22 Road Crossing
D01	42.284070	-73.470950	Confluence	River right: dry tributary (culvert under Route 22 visible)
D02	42.278130	-73.471790	Stream Impact	Mowed Meadow to bank; Footbridge near by
D03	42.277000	-73.471510	Historic	Old stone bridge abutments or breached dam
D04	42.275780	-73.471320	Impediment	Multiple downed trees - snapped off - creating a large blockage
D05	42.274780	-73.471880	Invasives	2 large patches of Japanese knotweed (additional patches observed upstream)
D06	42.274450	-73.471946	Stream Impact	Severe bank erosion (20ft wide) (adjacent to downed trees)
D07	42.274270	-73.471850	Impediment	River left: large area of erosion has caused multiple trees to block stream
D08	42.271450	-73.473229	Stream Impact	River right: Narrow/Lack of vegetated buffer behind residential property

Green River Section E



Legend

- Pipe
- Stream Impact
- Trash
- ✱ Invasives
- Impediment

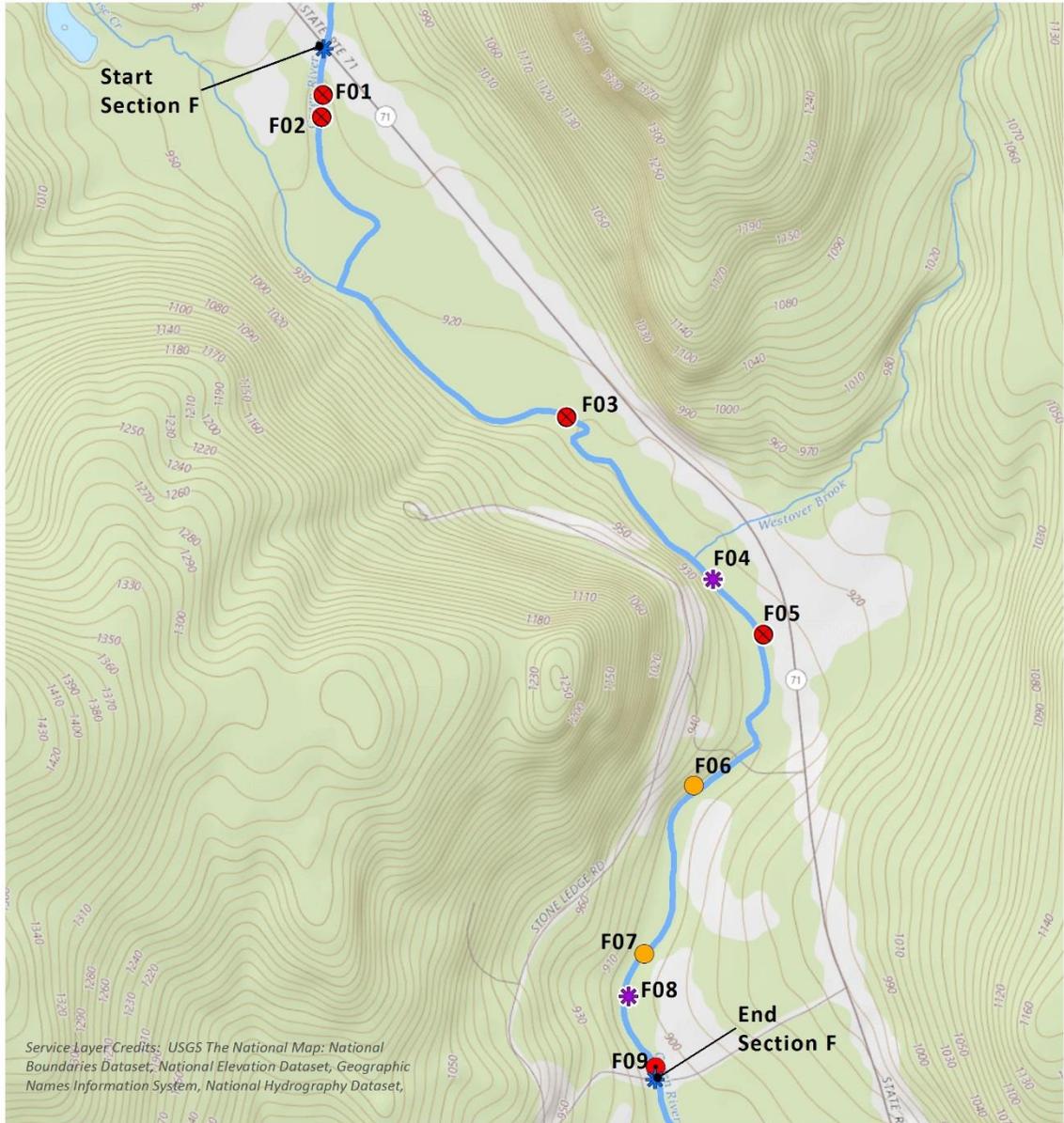


Map Author:
Stacy Deming, GISP
GIS Manager
Housatonic Valley Association

**Section E: Upper Hollow Road to NY-71 (south of Nobletown Rd.),
Hillsdale NY**

CODE	GPS COORDINATES		FEATURE	NOTES
E00	42.272082	-73.472819	Beginning of Section E	Upper Hollow Road Crossing
E01	42.271860	-73.472700	Pipe	Possibly a stormwater runoff pipe (18 inch, plastic) outfalls from River Road (no flow)
E02	42.271200	-73.473390	Stream Impact	Lack of vegetated buffer: Mowing to bank (river right)
E03	42.271420	-73.473188	Invasives	Brown algae covering stream bottom - possibly invasive Didymo
E04	42.268544	-73.470700	Invasives	Japanese knotweed along bank at River Road bridge (10 ft. x 2 ft. sized patch)
E05	42.268120	-73.470260	Trash	Woody debris and Styrofoam buried in streambed
E06	42.267480	-73.470650	Pipe	Possibly a stormwater runoff pipe (18 inch, plastic) outfalls from River Road (no flow)
E07	42.267950	-73.470340	Stream impact	Hose (river left) disappears into bank
E08	42.267310	-73.470550	Stream impact	Probable runoff channel from River Road

Green River Section F



Legend

- Pipe
- Stream Impact
- Trash
- ⊗ Impediment
- ✱ Invasives



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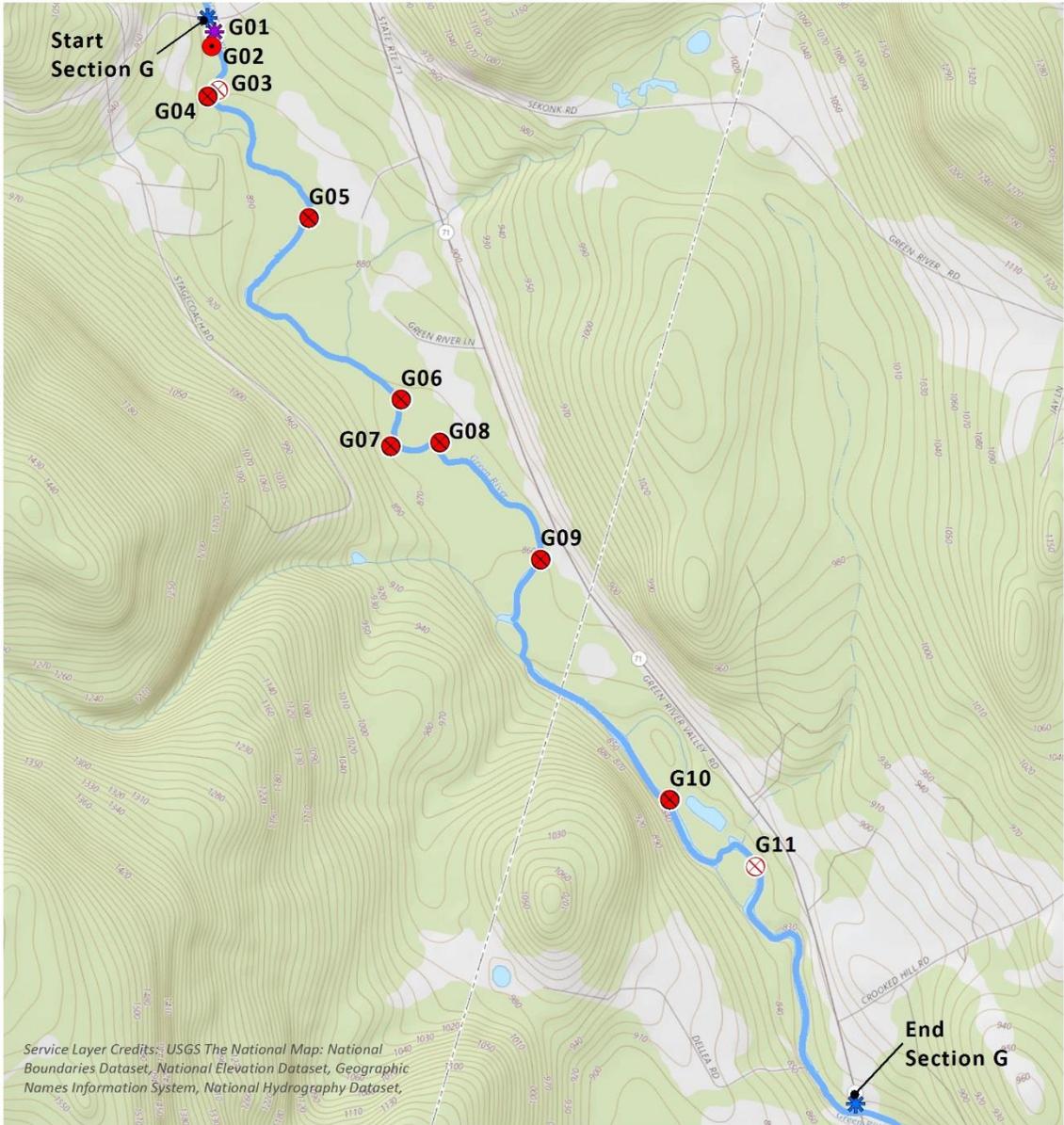


Map Author:
Stacy Deming, GISP
GIS Manager
Housatonic Valley Association

**Section F: NY-71 (south of Nobletown Rd.) to Overlook Drive,
Hillsdale NY**

CODE	GPS COORDINATES		FEATURE	NOTES
F00	42.261073	-73.470961	Beginning of Section F	Route 71 Road crossing - South of Nobletown Road
F01	42.260400	-73.470959	Stream Impact	Piling of yard debris on bank
F02	42.260080	-73.470980	Stream Impact	Lawn mowed to river's edge
F03	42.256004	-73.466010	Stream Impact	Cut trees piled at eroded river bank to help prevent further erosion (river left)
F04	42.253489	-73.463103	Invasives	Japanese knotweed
F05	42.252700	-73.462099	Stream Impact	Mowed lawn right up to river's edge
F06	42.250481	-73.463385	Trash	Defunct power line and box - across river and on west bank (river right)
F07	42.248010	-73.464280	Trash	Old metal field trash (field, river left, seems to maintain about a 25 ft. buffer
F08	42.247400	-73.464570	Invasives	Extensive patches of Japanese knotweed on the bank
F09	42.246240	-73.463920	Pipe	Storm drain outfall underneath bridge

Green River Section G



Legend

- Pipe
- Stream Impact
- ⊗ Impediment
- ✳ Invasives



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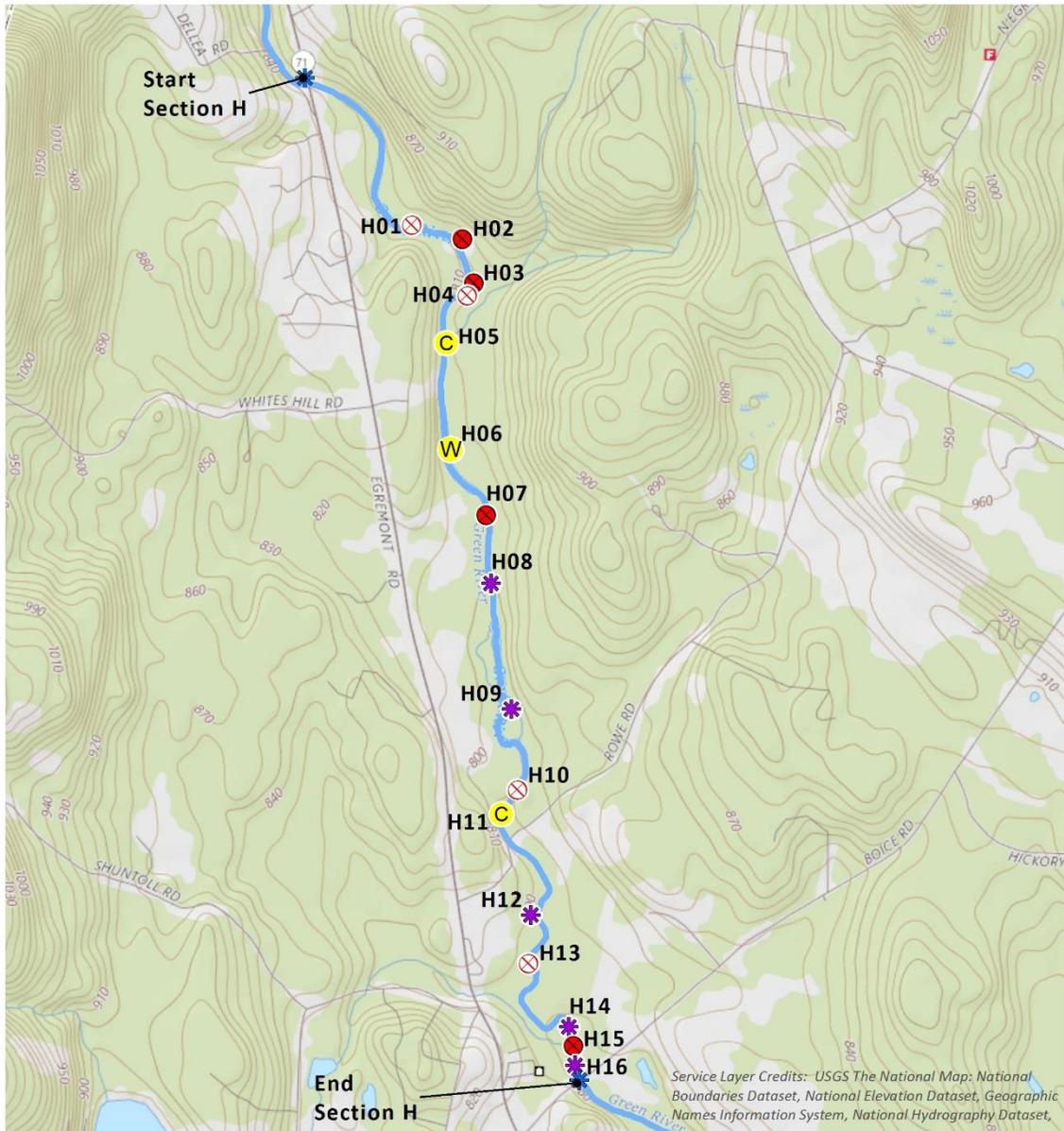


Map Author:
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**Section G: Overlook Drive, Hillsdale NY to
Route 71 (Green River Valley Road), Alford MA**

CODE	GPS COORDINATES		FEATURE	NOTES
G00	42.246200	-73.464014	Beginning of Section G	Overlook Drive Road crossing
G01	42.245944	-73.463827	Invasives	Both sides - initially river left but also river right - huge swath (occupied out of use farmland. Continues for quite a ways (1000 feet maybe)
G02	42.245643	-73.463891	Pipe	River right - Unused water pump - used to be used to fill swimming pool -no longer used (per Surveyor who owns the property)
G03	42.244816	-73.463705	Impediment	Beaver dam about 4ft high - just popped up in Aug / Sept
G04	42.244684	-73.463969	Stream Impact	River right - tree just came down (8 - 10 birch) - erosion is ongoing
G05	42.242374	-73.461262	Stream Impact	Bank shored up with rocks to slow erosion and protect building
G06	42.238907	-73.458754	Stream Impact	River left: rip rap/berm put in to direct the Green River back into the main channel after a storm. Berm too high to allow water to flow over and may be increasing erosion downstream.
G07	42.237997	-73.458994	Stream Impact	River right - lawn edge up to edge and erosion occurring
G08	42.238089	-73.457728	Stream Impact	River left: Eroding banks - gabion of rocks installed as preventative measure (homeowner is trying to protect land from eroding away
G09	42.235872	-73.455030	Stream Impact	River left: Eroding bank was shored up with riprap (mowed?) very near Route 71 - farm field fenced in
G10	42. 233522	-73.447830	Stream Impact	Below driveway bridge - Possible discharge from unused agricultural pond - brown and slimy covering the river substrate or Didymo? Would need further investigation
G11	42.229915	-73.449861	Impediment	Downed trees completely blocking passage: Surveyors couldn't get beyond this blockage

Green River Section H



Legend

- Confluence
- Stream Impact
- Impediment
- W Wildlife
- ✱ Invasives



1:16,000

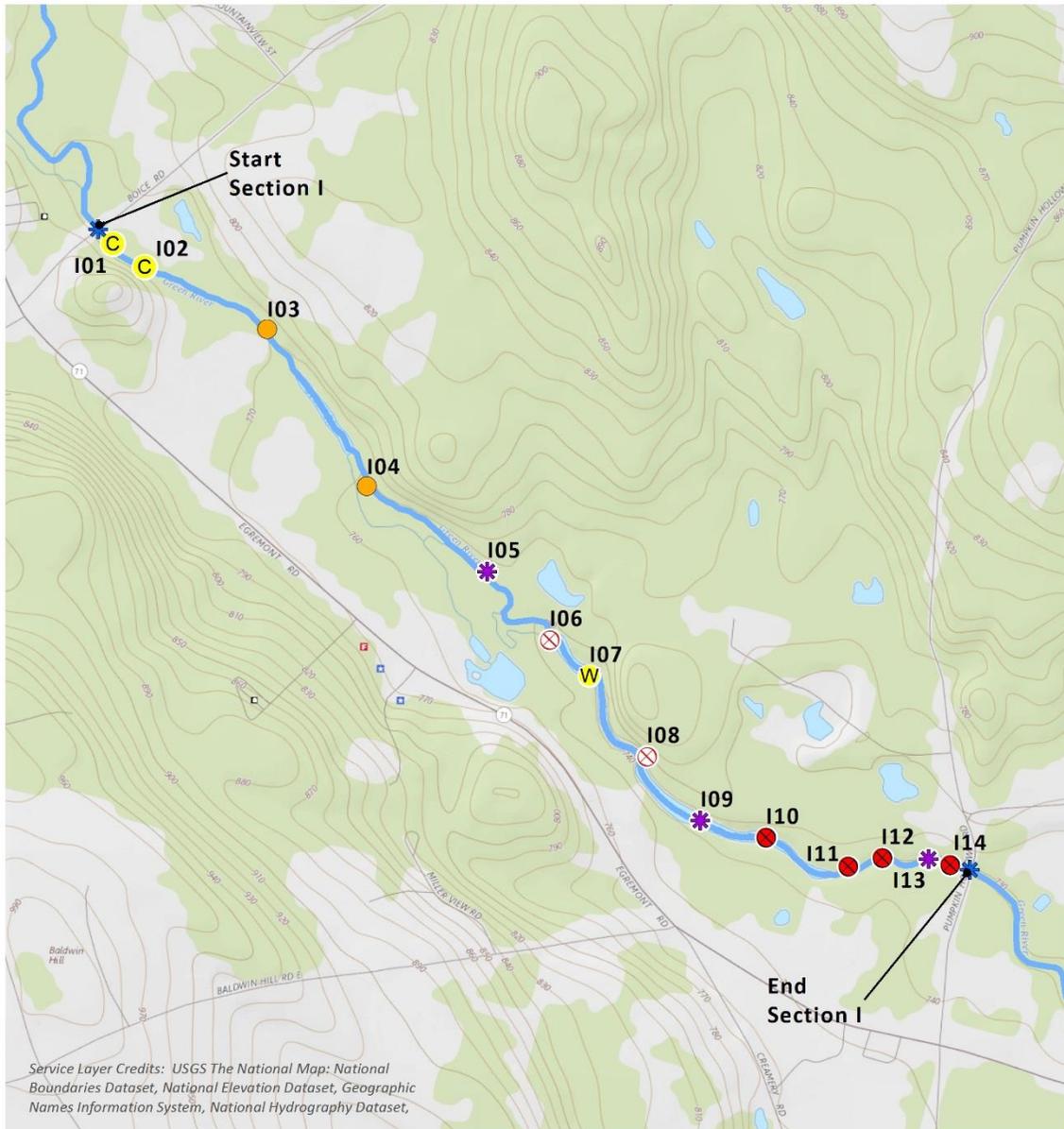


Map Author:
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Section H: Route 71 (Green River Valley Road) Alford to Boice Road, Egremont MA

CODE	GPS COORDINATES		FEATURE	NOTES
H00	42.225475	-73.446500	Beginning of Section H	Green River Valley Road crossing - North of Dellea Road intersection
H01	42.221760	-73.442700	Impediment	Multiple trees down - creating log jam
H02	42.221418	-73.440942	Stream Impact	Field mowed to river's edge
H03	42.220290	-73.440508	Stream Impact	Field mowed to river's edge
H04	42.219970	-73.440720	Impediment	Log jam and extensive knotweed
H05	42.218730	-73.441400	Confluence	River left: Unnamed tributary - icy inflow!
H06	42.215995	-73.441159	Wildlife	River left: Alford Wildlife Sanctuary
H07	42.214340	-73.439900	Stream Impact	Field edge bank undercut (also Multiflora rose, barberry and some Japanese knotweed)
H08	42.212590	-73.439670	Invasives	Many invasive plants in open (non-canopied areas)
H09	42.209360	-73.438850	Invasives	Japanese knotweed
H10	42.207290	-73.438600	Impediment	Downed tree; channel divides
H11	42.206650	-73.439120	Confluence	Unnamed small tributary (river right)
H12	42.204080	-73.438030	Invasives	Japanese knotweed on islands in the channel; multiflora rose on banks (smaller bushes)
H13	42.202840	-73.438090	Impediment	Downed tree; Japanese knotweed colonized sand bar (much native flora as well)
H14	42.200719	-73.436328	Invasives	Japanese knotweed extensive on sand bar and east branch for about 200yds (Also multiflora rose, bittersweet and dead Black gum and ash trees)
H15	42.200057	-73.436420	Stream Impact	Undercut bank
H16	42.200010	73.436360	Invasives	Japanese knotweed (both banks 20 x15ft) & Multiflora rose extensive

Green River Section I



Legend

- | | |
|--|---|
|  Confluence |  Stream Impact |
|  Impediment |  Trash |
|  Invasives |  Wildlife |



1:12,000

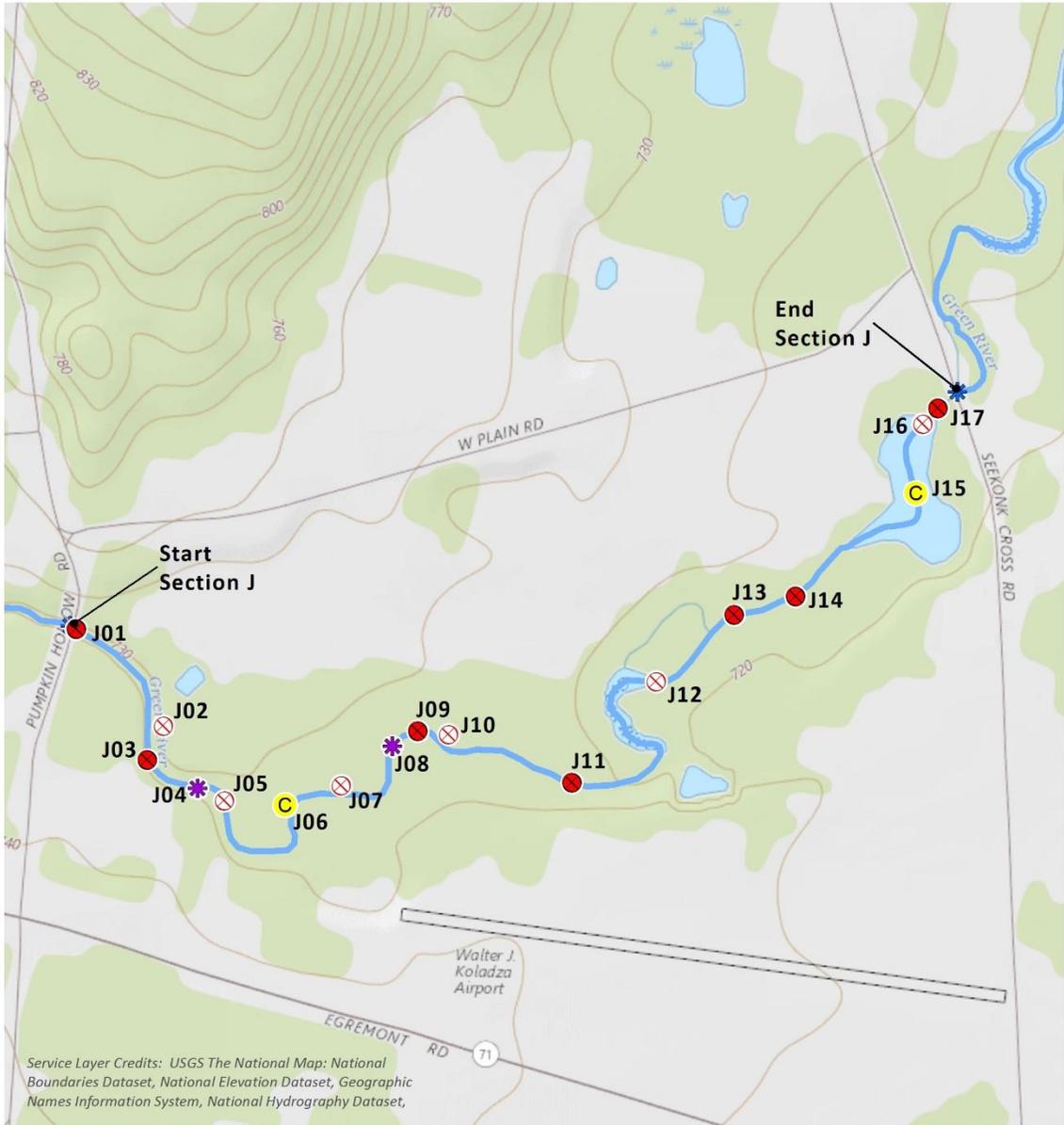


Map Author:
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Section I: Boice Road, Alford to Pumpkin Hollow Road, Great Barrington, MA

CODE	GPS COORDINATES		FEATURE	NOTES
I00	42.199867	-73.436216	Beginning of Section I	Boice Road crossing
I01	42.199815	-73.436130	Confluence	Buried Stream on bank right at Boice Road bridge
I02	42.199150	-73.434990	Confluence	Flow coming out of rocks on bank right; Significantly colder than water upstream
I03	42.198000	-73.431780	Trash	Old metal pieces and a tire on bank left
I04	42.194630	-73.429520	Trash	Rusted, buried car parts - path leads to picnic area in backyard (3559)
I05	42.193430	-73.425920	Invasives	Large mat of brown algae - possibly Didymo
I06	42.192140	-73.424280	Impediment	Downed tree; trapping woody debris and garbage
I07	42.191460	-73.423220	Wildlife	Strainers/ shallow pools, Kingfisher seen
I08	42.189930	-73.421690	Impediment	Downed tree: Live sycamore across river
I09	42.188720	-73.420260	Invasives	Brown algae in stream bed - Didymo suspected
I10	42.188420	-73.418550	Stream Impact	Mowed lawn right up to river's edge; Near soccer field
I11	42.187900	-73.416400	Stream Impact	Lack of vegetated buffer; Mowing to bank (river right); Not much erosion; Multiflora rose also seen in this area
I12	42.188370	-73.414040	Stream Impact	Mowed field to edge of river -- bank erosion occurring
I13	42.188000	-73.416100	Invasives	Japanese knotweed
I14	42.187900	-73.413600	Stream Impact	Lack of vegetated buffer and bank erosion

Green River Section J

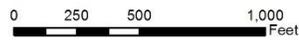


Legend

- Confluence
- ⊗ Impediment
- * Invasives
- Stream Impact



1:7,200

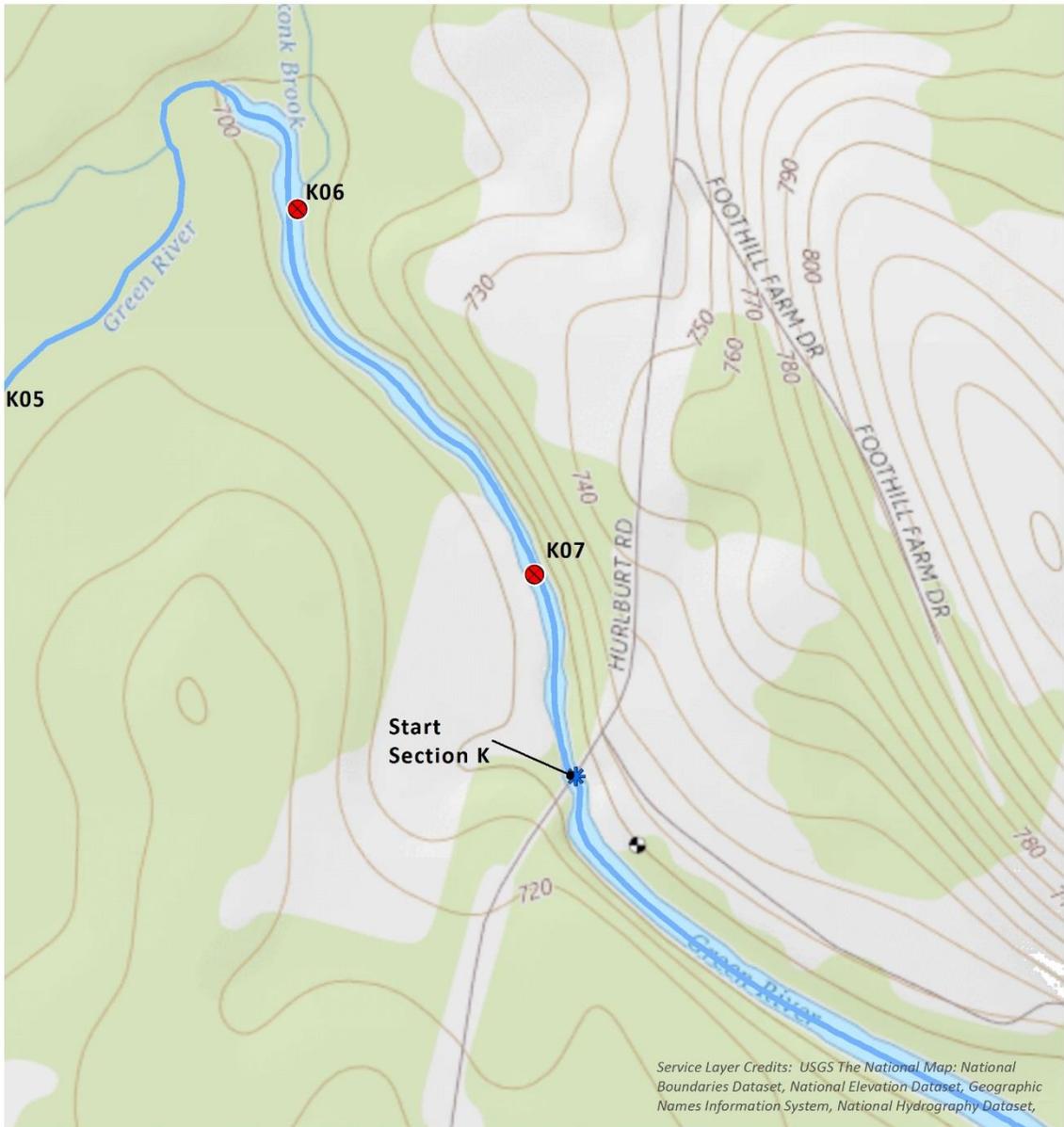


Map Author:
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Section J: Pumpkin Hollow Road to Seekonk Cross Road, Great Barrington MA

CODE	GPS COORDINATES		FEATURE	NOTES
J00	42.187888	-73.413242	Beginning of Section J	Pumpkin Hollow Road crossing; Trail indicates people are accessing the river (river left)
J01	42.187850	-73.413160	Stream Impact	Narrow vegetated buffer both sides; residential (river left) farm field (river right)
J02	42.186750	-73.411761	Impediment	Multiple trees down across river, gravel beach river right with fire pit, several small patches of knotweed
J03	42.186350	-73.412000	Stream Impact	River right: Farmer's field - farmed to river's edge for about 300 feet
J04	42.186032	-73.411202	Invasives	Japanese knotweed (75ft x 15ft)
J05	42.186102	-73.41054	Impediment	Downed tree at surface trapping leaves; bank erosion (river left)
J06	42.185859	-73.409831	Confluence	Unnamed small tributary (river right)
J07	42.186104	-73.408970	Impediment	Multiple trees down across river
J08	42.186890	-73.408049	Invasives	Japanese knotweed (10ft x 5ft)
J09	42.187012	-73.407831	Stream Impact	Bank erosion - minor amounts here and additional places along the section even where there is forested buffer
J10	42.186727	-73.407311	Impediment	Multiple trees down blocking passage
J11	42.186200	-73.405367	Stream Impact	Vegetated buffer narrows considerably; sumac visible on edge; banks become steep (6-8ft) some erosion
J12	42.186804	-73.403419	Impediment	Multiple trees down - some fully and others only partially across
J13	42.188395	-73.402922	Stream Impact	Mowed field to river's edge (might be providing private access). Some bank erosion evident
J14	42.188665	-73.402110	Stream Impact	Mowed field to river's edge
J15	42.189639	-73.399833	Confluence	River left: Unnamed tributary - may just drain wetland area
J16	42.190387	-73.399790	Impediment	Multiple trees blocking river (Winged euonymus observed)
J17	42.190637	-73.399787	Stream Impact	Drainage channel - looks manmade (on Google Earth can see standing water next to the field)

Green River Section K

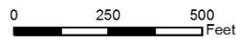


Legend

-  Confluence
-  Impediment
-  Invasives
-  Stream Impact



1:4,800

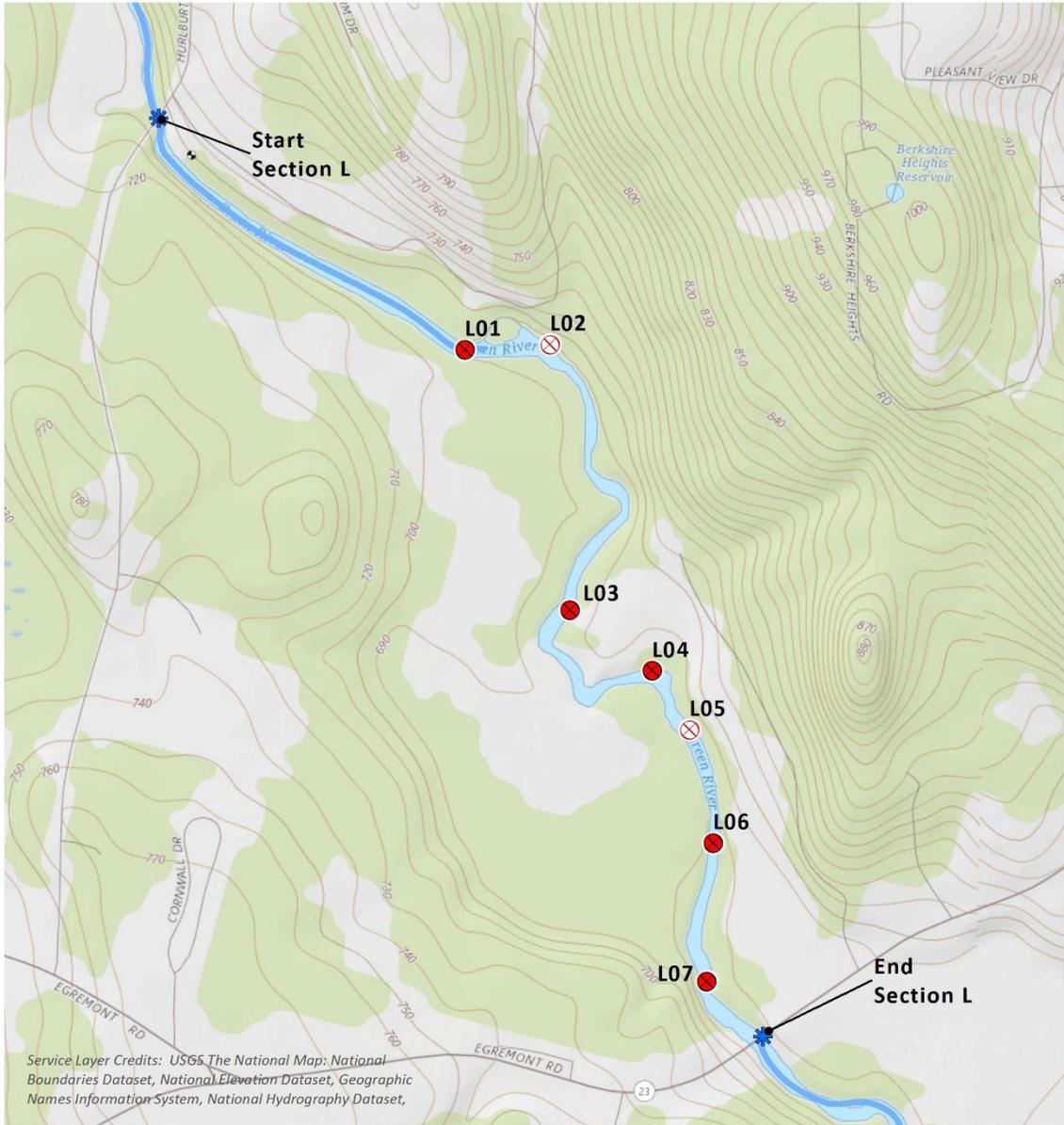


Map Author:
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Section K: Seekonk Cross Road to Hurlburt Road, Great Barrington MA

CODE	GPS COORDINATES		FEATURE	NOTES
K00	42.190734	-73.399574	Beginning of Section K	Seekonk Cross Road crossing
K01	42.191392	-73.398805	Stream Impact	Lack of vegetated buffer; farm field mowed up to river's edge (about 250 feet on the bend) (river right)
K02	42.191839	-73.399931	Stream Impact	Seekonk Cross Road borders river/ river likely eroding road
K03	42.192530	-73.39836	Invasives	Japanese knotweed (approx. patch size 20ft X5ft)
K04	42.192910	-73.39825	Impediment	Downed trees across river
K05	42.195130	-73.39733	Impediment	Lots of downed trees; electric fence/ fireplace as well
K06	42.196900	-73.39435	Stream Impact	Standing water, cloudy, sewage smell, Lots of algae
K07	42.194170	-73.39180	Stream Impact	Bank erosion

Green River Section L



Legend

-  Impediment
-  Stream Impact



1:9,000

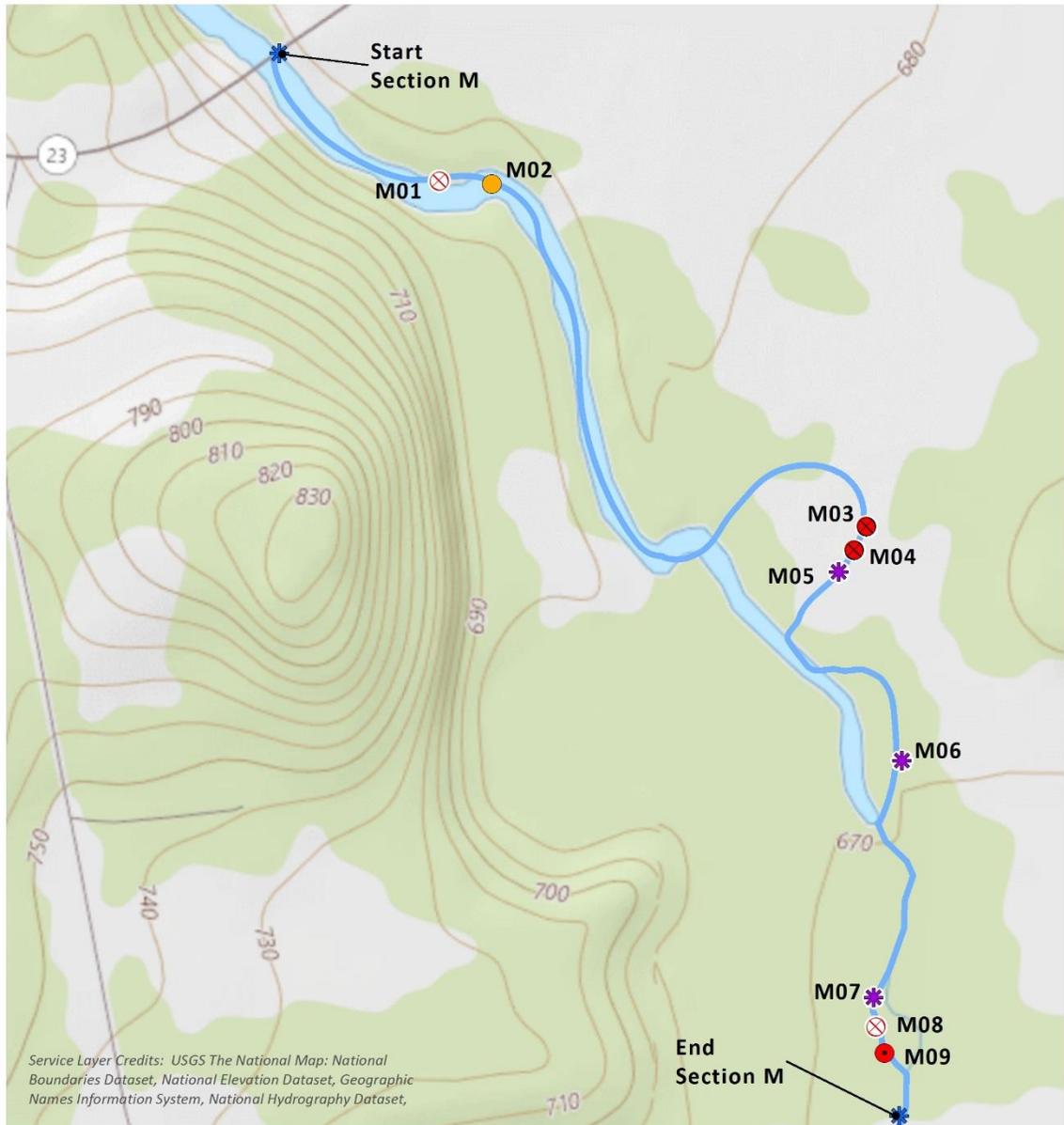


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Section L: Hurlburt Road to Route 23/41 (Maple Avenue)

CODE	GPS COORDINATES		FEATURE	NOTES
L00	42.192747	-73.391267	Beginning of Section L	Hurlburt Rd Bridge; Flow gage under bridge
L01	42.189293	-73.385246	Stream Impact	130 foot eroded bank; Lack of vegetated buffer
L02	42.189395	-73.383588	Impediment	Manmade dam downstream of "pump house spot"
L03	42.185542	-73.383087	Stream Impact	Fence falling into river due to eroded bank, lack of vegetated buffer along field
L04	42.184915	-73.381347	Stream Impact	Erosion around bend in river; Lack of vegetated buffer
L05	42.183850	-73.380700	Impediment	Beaver dam; looks recently constructed
L06	42.182210	-73.380190	Stream Impact	Bank erosion (river left) not much of a buffer between river and corn field
L07	42.180200	-73.380260	Stream Impact	Algae filled canal: Water appears to be grey/cloudy with thick with algae and vegetation

Green River Section M

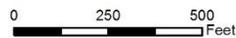


Legend

- Pipe
- Trash
- Stream Impact
- ⊗ Impediment
- ✱ Invasives



1:4,800



Map Author:
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Housatonic Valley Association

Section M: Route 23/41 to Wyantenuck Golf Course Bridge

CODE	GPS COORDINATES		FEATURE	NOTES
M00	42.179418	-73.379131	Beginning of Section M	Maple Avenue bridge (which is Rte.. 23/41)
M01	42.178460	-73.377440	Impediment	Manmade dam created with large rocks
M02	42.178440	-73.376890	Trash	Fire pit with associated trash
M03	42.175850	-73.372910	Stream Impact	Corn planted right up to river's edge; bank eroding
M04	42.175560	-73.372760	Stream Impact	Runoff from field creating a gully
M05	42.175680	-73.373130	Invasives	Brown algae in stream bed possibly Didymo
M06	42.174067	-73.372317	Invasives	Japanese knotweed from river bank creeping into corn field, large patch of Japanese knotweed visible in middle of cornfield from left bank
M07	42.172126	-73.372760	Invasives	Japanese knotweed approx. size patch 10ft X10ft
M08	42.171975	-73.372695	Impediment	Downed trees blocking river
M09	42.171830	-73.372700	Pipe	Possible buried pipe

Green River Section N

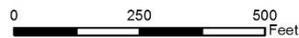


Legend

- Pipe
- Stream Impact



1:3,600

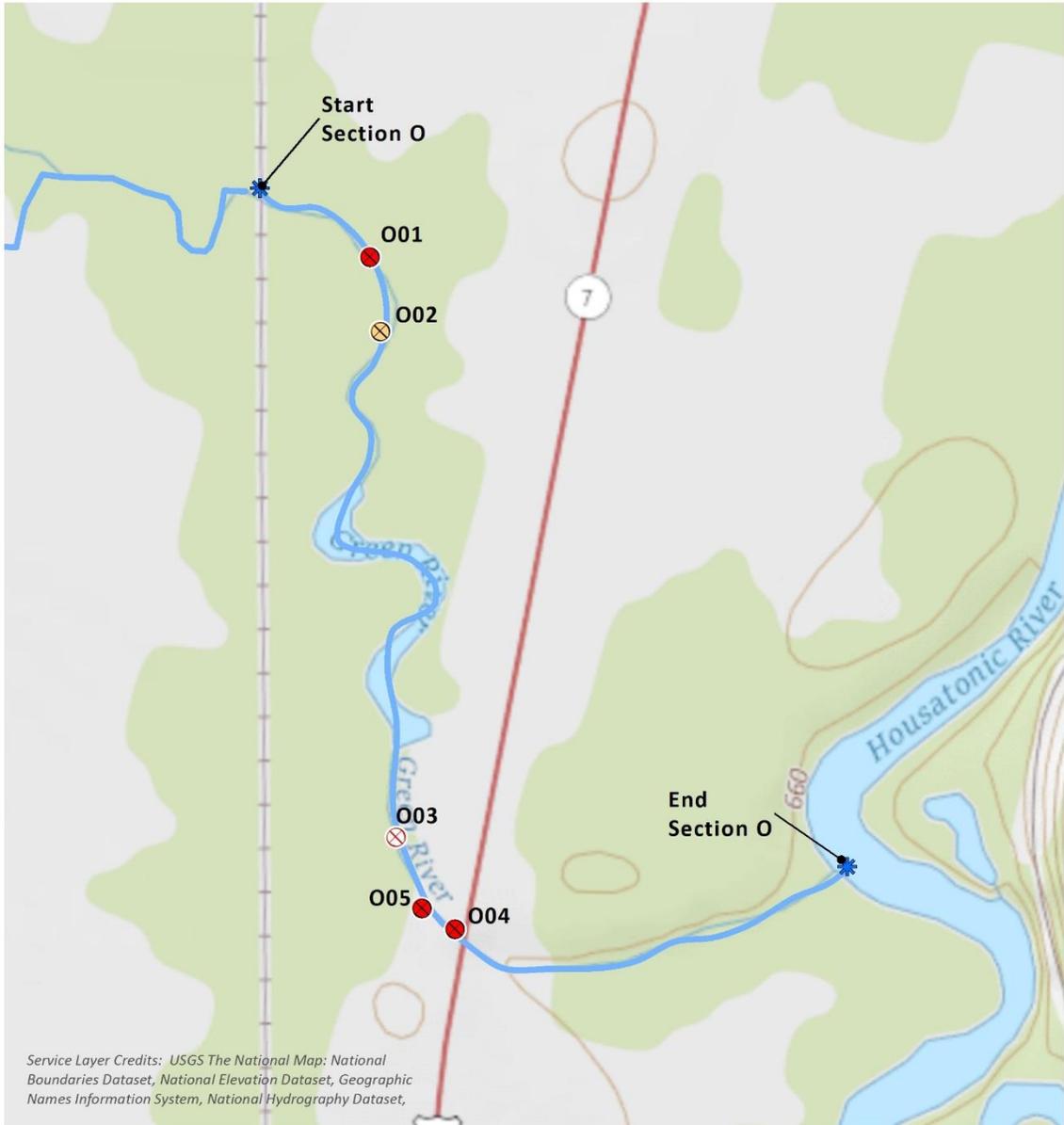


Map Author:
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Section N: Wyantenuck Golf Course Bridge to Railroad Bridge

CODE	GPS COORDINATES		FEATURE	NOTES
N00	42.171286	-73.372432	Beginning of Section N	Bridge on Wyantenuck Golf Course Road.
N01	42.170300	-73.370480	Stream Impact	Golf Course, sparsely vegetated buffer (about 75 ft. of bank), fish observed; many golf balls in the river.
N02	42.168480	-73.369450	Stream Impact	Large area of erosion; Lack of vegetated buffer along cornfield
N03	42.168600	-73.367310	Pipe	Drainage from Wyantenuck Golf Course; Thick aquatic vegetation in drainage area, whereas it was sparse for the rest of the section.

Green River Section O

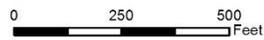


Legend

-  Impediment
-  Land Impact
-  Stream Impact



1:4,200



Map Author:
Stacy Deming, GISP
GIS Manager
Housatonic Valley Association

Section O: Railroad Bridge to Confluence with Housatonic River

CODE	GPS COORDINATES		FEATURE	NOTES
O00	42.168550	-73.366940	Beginning of Section O	Railroad Bridge south of Wyantenuck Golf Course
O01	42.168255	-73.365659	Stream Impact	Lack of vegetated buffer adjacent to farm field - potential trash dump
O02	42.167704	-73.364886	Land Impact	Commercial Building; river edge rip rapped - no vegetated buffer (gravel edge between parking lot and river) stormwater runoff concern
O03	42.164110	-73.365230	Impediment	Multiple trees down that are completely across the river
O04	42.163560	-73.365020	Stream Impact	Erosion near Rte. 7 bridge; Blowdown, animal tracks under bridge.
O05	42.163694	-73.365327	Stream Impact	Concrete used as erosion control; Narrow vegetated buffer to field
O06	42.163880	-73.361250	End of Section O	Confluence of the Housatonic and Green Rivers. Green River is clear and narrow with a gravel substrate, Housatonic is wider with tea colored water and a substrate comprised of mostly sand and mud

V. Green River Recommended Action Plan

A. Condition Summary

The Green River is a high quality cold water fish resource and is a very aesthetically pleasing river. The water is clear, cold and inviting. There is minimal development along the river corridor. It flows primarily through forested and agricultural lands as well as some lightly populated residential areas. It was evident that many property owners along the river simply enjoy the river. Despite the lack of public access, residents and visitors find ways to enjoy the river for its excellent fishing and swimming. Paddling the river is not recommended as it is very shallow much of the year and there are many fallen trees impeding passage. The top three concerns noted by the Stream Team members were: (1) bank erosion (2) lack of vegetated buffer at the river's edge and (3) the presence of the invasive Japanese knotweed.

The Green River is, by nature, a highly erodible river due to the composition of its primarily gravel substrate. The river is constantly shifting and reforming: creating new gravel bars while eroding old and making new channels while closing off old channels. In several places river braiding occurs where there are multiple channels. While natural, the erosive nature of the Green River is problematic in places where property is being eaten away and where fallen trees alter the water's force and its impact on the river banks and downstream. In addition, the increased severity of storms is likely to increase the erosive force of the Green River. A related concern is the lack of vegetation along some stretches of the river where farm fields are cultivated or residential lawns are mowed right up to the river's edge. Lack of deep rooted vegetation can also make the river banks more vulnerable to erosion and provides less of a buffer to any runoff.

Finally, the invasive plant, Japanese knotweed is invading the banks of all but the first section of the Green River. Even on the first section, Japanese knotweed was observed at a road crossing on Fog Hill Road, where a tributary of the Green River flows under the road. Japanese knotweed is difficult to eradicate once established, but it would be worthwhile to control Japanese knotweed especially where there is critical habitat. It can degrade turtle nesting habitat as turtles like open sandy areas. Japanese knotweed is shallow rooted and therefore can also make the river banks more vulnerable to erosion.

B. Short-Term Recommended Actions

1. Inform New York Department of Environmental Conservation of potential Didymo observations. Discuss posting additional signage to warn anglers. (Sections C, D, E, F)
2. Investigate presence of Didymo. Inform Massachusetts Division of Fisheries and Wildlife of potential Didymo observations. Discuss posting signage to warn anglers. (Section I, M)
3. Inform Hillsdale Conservation Advisory Council about tree cutting used to shore up bank against erosion. (Section F)
4. Investigate possibility of removing car parts and power line. Schedule river cleanups (Sections F & I)

5. Test the water quality in areas where there were concerns (sewage smell, Section K; canal of “greyish” water, Section L; drainage channel, Section N)
6. Investigate possibility of river access site at pump station (Section L)
7. Schedule a trash and debris cleanup of surround area at swimming hole. (Section M)
8. Discuss with Country Club Managers low impact land use practices. (Section N)
9. Discuss with Great Barrington Conservation Commission and business owners about concerns with herbicide use near river and stormwater runoff from commercial property (Section O)

C. Recommended Long-Term /Ongoing Projects

1. Investigate possibility of working with MA and NY Departments of Transportation to infiltrate stormwater runoff from highway rather than direct it to the river. (Sections A, B, D, E, F)
2. Determine if stormwater runoff is impacting river and work with Town and State to minimize impact (Section K)
3. When NY-Rte. 22 bridge (1st crossing) is to be replaced, encourage replacement bridge to meet state guidelines: <http://www.dec.ny.gov/permits/49066.html> (Section A)
4. Investigate possibility of invasive species removal management particularly Japanese knotweed. (All Sections *except* N & O)
5. Work with towns and state to investigate the disappearance of the river and determine if it is natural or if there is human impact. (Section B)
6. Educate riverside land owners about the benefits of vegetated buffers. (Section B, C, D, E, F, G, H, I, J, L)
7. Investigate possibility of bank stabilization project. (Sections C, D, E, F, G, H, I, L, M, N, O)
8. Many sections had multiple trees down. In the event that landowners want to create a navigable passage through the many blowdowns, develop an educational program to provide information about how to create a channel yet preserve the wildlife habitat elements woody debris in the river provides (Sections J, K)
9. Investigate possibilities of downed bridge removal (Section C)
10. Investigate any farm impacts to the river. Work with farm owner and US Department of Agriculture, Natural Resources Conservation Services (NRCS) to improve and maintain vegetated buffers and minimize any farm impacts (E, J, K, L, M, N, O)
11. Determine if height of berm created in restoration project is increasing erosion downstream and should be lowered to dissipate water’s energy and allow river to flow in side channel during high water. (Section G)
12. Investigate possibilities of educating landowners about the importance of woody debris in the river, in the event they desire to open a channel (Sections G, H, I, J, K)
13. With support of towns and in collaboration with residents, determine if public access to the Green River would be possible and desirable in a couple of locations.

VI. Appendix A: Resource Information

New York Department of Conservation (NY DEC)

The complete publication entitled: *Housatonic River Basin Waterbody Inventory & Priority Waterbodies list, July, 2008* completed by the New York State, Bureau of Watershed Assessment, Department of Environmental Conservation is available at www.dec.ny.gov/docs/water_pdf/pwlhous08.pdf.

Harvey Mountain State Forest (2,007 acres) is in the headwaters of the Green River. It is managed by the NY DEC for multiple uses, including timber production, watershed protection, wildlife habitat, and recreation. Harvey Mountain is the highest elevation in Columbia County at 2,065 feet. The forests provide ample opportunity for outdoor recreation year round. Harvey Mountain State Forest is accessible from NY State Route 22 and East Hill Road in the town of Austerlitz. More information about Harvey Mt. State Forest can be found at <http://www.dec.ny.gov/lands/66460.html>.

New York Conservation Advisory Councils:

Hillsdale: <https://hillsdaleny.com/committees/conservation-advisory-council/>

Massachusetts Conservation Commissions:

Alford: <https://townofalford.org/>

Egremont: <http://www.egremont-ma.gov/> Agendas and minutes found under “Meetings, Notices, and Announcements”

Great Barrington: <https://www.townofgb.org/conservation-commission>

NOTE: Section 9.2 of the Zoning Bylaws regulates work within a five-hundred-foot distance of the Green River and its upstream tributaries of the water supply gallery through a Special Permit process. The Commission is a recommending board to the Special Permit Granting Authority. Applicants should contact the Zoning Officer (Building Official) for more information regarding the Special Permit process. Accordingly, these Regulations protect the Great Barrington Drinking Water Supply and its upstream tributaries.

https://www.townofgb.org/sites/greatbarringtonma/files/uploads/wetlands_protection_.pdf

“The aquifer beneath the Green River is the primary source of drinking water for much of Great Barrington. The Great Barrington Fire District Water Department maintains a pump station adjacent to the Green River and associated storage tank and distribution lines in order to provide water to downtown and the surrounding neighborhoods. Great Barrington depends on cooperation from other municipalities, including those in New York State, to protect its water resource.” *Great Barrington Master Plan, October 2013.*

VII. Appendix B: Invasive Species Information

What are invasive plants?

Invasive plants are non-native species that have spread into native or minimally managed plant systems in Massachusetts. These plants cause economic or environmental harm by developing self-sustaining populations that dominate and/or disrupt native ecosystems. Invasives have left behind the herbivores and diseases that typically control their populations in their native habitats, and they have reproductive mechanisms that allow them to rapidly grow, mature and spread. Apart from forming dense stands that crowd or shade-out natives, certain invasive species can alter ecosystem processes such as hydrology, soil chemistry, and the frequency of natural fires.

Japanese knotweed (*Polygonum cuspidatum*)

Japanese knotweed, also known commonly as “bamboo” is a native of Japan that was brought to the US from Britain in the late 1800’s as an ornamental.

Ecological Threat: Japanese knotweed spreads vegetatively and by seed, forming dense thickets that threaten native plant communities in wetlands and riparian areas. It has the ability to survive severe flooding and readily colonizes island habitats and shorelines. Once established, its populations are highly persistent and difficult to eradicate.

Description: Japanese knotweed is an upright perennial herb with multiple, dense shoots that can grow up to 10 feet in height. Like a bamboo, stems are stout, round and hollow, with swollen joints at leaf nodes. Shoots from stout subterranean rhizomes may spread horizontally as far as 65 feet. Leaves are broadly ovate and alternate. Tiny white or greenish-white flowers develop in late summer and grow in numerous linear clusters that form a mass of white over the plant when in full flower. Frost-killed stems turn bronze colored and may remain upright through the winter.

Japanese knotweed grows is hardiest in full sun environments. It commonly grows along streams, riverbanks and in disturbed areas such as roadsides.

Disposal: Stem and root fragments as small as ½ inch can sprout so special care must be taken to contain the plant parts when using manual control. Do not allow plant parts to enter waterways during control. Cut stems may be piled on a raised platform, brush pile or tarp for drying.

Do not compost plant materials as they may sprout and then spread. Piles may be burned. Do not remove soil or plant material from the site unless being disposed of in a landfill. ⁶



A patch of Japanese knotweed in Section G near the railroad bridge adjacent to Clapp Park on the Southwest Branch. Photo Credit: Yvonne Borsody

⁶ NRCS Pest Management – Invasive Plant Control – Japanese Knotweed *Conservation Practice Job Sheet MN-797*

Didymo – A Native or Invasive Algae?⁷

The Freshwater algae, *Didymosphenia geminata* (Didymo) has been identified in Massachusetts waters. Sites with sporadically visible blooms of Didymo include the Green River in Southern Berkshire County and locations on the Upper Branches of the Westfield River.



Once thought to be an introduced invasive, Didymo is now believed to be native to North America and the New England region. Mass Wildlife does not know how many streams in Massachusetts contain Didymo, as it is visually undetectable unless in bloom. Blooms may appear gray, brown, or white and has a texture of wet wool or cotton balls. Blooms, which happen only when certain conditions (including flow, nutrients, light intensity, and water chemistry) are present, can produce a dense covering on rocky substrate and eventually result in long stalks. Extensive Didymo blooms can temporarily cover river bottoms almost entirely. Didymo generally occurs in cold, clear, nutrient-poor waters with a neutral or slightly basic pH.

The frequency and intensity of Didymo blooms vary widely between watersheds because of differing environmental conditions. In the Northeast, Didymo blooms have been observed in NH, VT, CT, NY, PA, VA, MD and WV. In Massachusetts, there have been no reported changes to fisheries resulting from the few Didymo blooms. There is no known method for eliminating or controlling Didymo, although blooms lasting more than a few weeks are uncommon.

It is unknown if Didymo has been transferred in Massachusetts by human activity or if it historically found statewide. However, it is good practice to Clean, Drain, and Dry equipment between uses, particularly when moving between waterbodies, to prevent the transport of any plant or animal species. All recreational users should always thoroughly wash equipment, clothing, waders, and boats in hot, soapy water. Boats and other non-absorbent materials should be scrubbed. Soft, absorbent materials should soak in hot, soapy water for a minimum of 30 minutes and dried thoroughly before reuse.

⁷ <http://www.mass.gov/eea/agencies/dfg/dfw/fish-wildlife-plants/fish/didymo-in-massachusetts.html>

VIII. Appendix C: Stream Assessment Survey Forms

The following multi-page “Shoreline Survey” form from the Massachusetts Division of Ecological Restoration’s ***Adopt a Stream*** program is the template HVA used for stream team members to record their river observations⁸. These visual observations, along with locations identified with GPS coordinates and photographs taken by stream team members, are part of the permanent record for each stream assessment and are retained on file at the Berkshire office of the Housatonic Valley Association located in Stockbridge. The stream assessment data has been converted into a data layer by HVA staff. Digital versions of the data layer and maps are available. Please contact Dennis Regan at 413-298-7024 or email dregan@hvatoday.org.

⁸ <http://www.mass.gov/eea/docs/der/riverways/adoptastreamcasestudy.pdf>

Adopt a Stream

SHORELINE SURVEYS

A Stream Team Monitoring Project and Action Tool

Data Sheets



Riverways Program, Division of Ecological Restoration
Department of Fish and Game

Adapted from *Shoreline Surveys Leaders' Manual*, Publication No. 17795-94-500-2.08 .CIR
Approved by Philmore Anderson III, State Purchasing Agent

Riverways Program, Division of Ecological Restoration

Tips for Shoreline Surveyors

Safety and Legalities

- ◆ Always walk with someone.
- ◆ Watch out for irate dogs. Walk cautiously and practice good dog etiquette.
- ◆ Do not drink the river water.
- ◆ Lifejackets are required by law for each person in the canoe.
- ◆ From September 15 to May 15 all canoe or kayak occupants must wear a U.S. Coast Guard Approved Personal Flotation Device.
- ◆ Wear long-sleeved shirts and pants to protect against ticks, mosquitoes, poison ivy and nettles.
- ◆ Wear insect repellent if necessary.
- ◆ Consider landowner rights. Ask permission to cross private land, posted or not.
- ◆ Do not enter posted areas without permission. Take advantage of any public access points.

Environment:

- ◆ Don't walk on unstable banks; your footsteps could speed erosion.
- ◆ Be aware of wildlife and animal homes, for both of your sakes.

NEVER PUT YOURSELF INTO DANGER TO GATHER SURVEY INFORMATION.

If at anytime you feel uncomfortable about the stream conditions or surroundings, please STOP your Shoreline Survey. You and your safety are much more valuable than any of the objectives of the Shoreline Survey.

Checklist: What to take on your Survey

Optional:

- | | |
|--|---|
| <input type="checkbox"/> A buddy | <input type="checkbox"/> Rubber boots or waders |
| <input type="checkbox"/> Data sheets and map | <input type="checkbox"/> Yardstick or measuring tape (useful for pipes) |
| <input type="checkbox"/> Clipboard or other surface for writing | <input type="checkbox"/> Compass |
| <input type="checkbox"/> Two pens/pencils – color is good to mark on maps | <input type="checkbox"/> Field guides (in ziplock bags) |
| <input type="checkbox"/> Long-sleeved, snag-free clothing /pants (for bugs and thorns) | <input type="checkbox"/> Food, for energy! |
| <input type="checkbox"/> Sunblock | |
| <input type="checkbox"/> Sunglasses (polarized to see into the water better) | |
| <input type="checkbox"/> Lifejackets & paddles if canoeing | |
| <input type="checkbox"/> Camera and film | |
| <input type="checkbox"/> Gloves | |
| <input type="checkbox"/> Copy of letter sent out to landowners | |

What you need to do:

Tonight: Coordinate with your segment team. Arrange canoes, meeting place, etc.

This weekend: Conduct the survey! Fill out the data sheets while you're on the river. With your team, fill out the *Summary Sheets*—the segment description and the priority Sheet--after you are finished surveying your segment. Return all *Data* and *Summary Sheets* (one set per team) to:

_____ Return by: _____

This month: Attend action planning meeting, which will be held: _____

Riverways Program, Division of Ecological Restoration

Segment begins: _____
 Segment ends: _____

Date: _____
Observers: _____
Today's weather: _____
Weather over past 24 -48 hours: _____

If you take photographs, mark the location on the map, and write it on the backs of the photos, along with date. Be specific (reference nearby road or house), so that people can compare later photos

Stream Reach

What is the stream bottom made of? (mark from 1=most typical to 6=least typical)

- | | |
|------------------------------------|-----------------------|
| ___ Organic debris (leaves, twigs) | ___ Gravel (1/4 - 2") |
| ___ Silt (mud) | ___ Cobbles (2 -10') |
| ___ Sand (1/16 to 1/4") | ___ Boulders (> 10") |

Temperature	
Water	___
Air	___

What color is the water? (circle) Cloudy Tea Milky Muddy Other _____

How deep is the water? (circle) Less than 1' More than 1' More than 2' More than 3'

How does the water level compare to normal for this time of year? (circle)
 Normal Higher Lower Don't know If very high or low, can you tell why?

Flow (circle) Fast Slight Almost still

Gradient low moderate steep

Sinuosity straight meandering braided channelized

Is your reach characterized by step pools riffles/pools riffle/runs run

Is stream flow blocked by...(circle and *locate on map.) Trees Trash Large objects

Reach Habitat

Large woody material	Abundant	Moderate	Sparse	None
Small organic material	Abundant	Moderate	Sparse	None
Undercut banks	Abundant	Moderate	Sparse	None
Overhanging vegetation	Abundant	Moderate	Sparse	None
Aquatic vegetation	Abundant	Moderate	Sparse	None

Are there areas covered with algae? (Circle) Streambed Around pipes Rocks

*If algae seems abnormally heavy, *locate on map. Draw in extent of algae on map.*

Human Alterations

Water Quality

- Oily sheen or smell
- Sewage: smell, milky color, toilet paper
- Foam or scum (*describe. Does a stick break it up?*)
- Fishy odor or fish kill
- Garbage

Hydrology

- Dams
- Culverts
- Excess Sedimentation
- History of Flooding
- History of Drying Up

If any of these are checked, please comment on in Narrative Section

Do you see runoff from any of the following? (*circle. *If run-off is significant locate on map.*)

- | | | | | |
|---------|-----------------------|---------------|--------|-------------|
| Manure | Pet / goose droppings | Parking lots | Sewage | Roads |
| Bridges | Construction | Plowed fields | Lawns | Other _____ |

Riparian Area and Land Use

Bank stability/Channel Condition:

- | | | |
|-------------------------|-------------------------|-----------------------|
| Intact | Erosion in some areas | Erosion in many areas |
| Collapsed in some areas | Collapsed in many areas | Channelized |

What is the stream bank cover? (*circle. Put a star* next to the most common.*)

Left Bank: (Looking downstream) (If doing only one bank, indicate which one)

- | | | | | | |
|---------|--------------------|-----------------|----------------|---------------|------------------------|
| Eroding | Moss | Trees/Shrubs | Exposed Roots | Grass/Flowers | Loosestrife/Phragmites |
| Beaches | Riprap/channelized | Shrubs/brambles | Wetlands/marsh | | |

- | | | | | | | |
|--------------------|---------|--------------------|-----------------|----------------|---------------|------------------------|
| <u>Right Bank:</u> | Eroding | Moss | Trees/Shrubs | Exposed Roots | Grass/Flowers | Loosestrife/Phragmites |
| | Beaches | Riprap/channelized | Shrubs/brambles | Wetlands/marsh | | |

Is there a vegetated riparian area beyond the stream bank? If yes, indicate condition.

(*circle. Put a star*next to the most common.*)

- | | | | | | |
|--------------------|----------------|----------------------|----------------|---------------------|------|
| <u>Left Bank:</u> | Shrubs/grasses | mowed pasture/meadow | Forested/trees | Park with few trees | Lawn |
| <u>Right Bank:</u> | Shrubs/grasses | mowed pasture/meadow | Forested/trees | Park with few trees | Lawn |

If area is not vegetated, please describe condition: (i.e. parking lot, pavement, roadway, buildings)

- Left Bank: _____
- Right Bank: _____

If the riparian area is forested or in shrubs and grasses, estimate width of the vegetated area (to a lawn, road, or other change in land use) left bank _____ right bank _____

What are the land uses visible from the river? (*checkmark all that apply & circle the dominant land use type*)

- | | | |
|---|---------------------------------------|--|
| <input type="checkbox"/> Industrial | <input type="checkbox"/> Parking lots | <input type="checkbox"/> Golf courses |
| <input type="checkbox"/> Commercial | <input type="checkbox"/> Roads | <input type="checkbox"/> Protected/conservation land |
| <input type="checkbox"/> Agricultural | <input type="checkbox"/> Landfills | <input type="checkbox"/> Undeveloped/unprotected land |
| <input type="checkbox"/> Residential | <input type="checkbox"/> Railroads | <input type="checkbox"/> Wastewater treatment plants |
| <input type="checkbox"/> Park/ ballfields | <input type="checkbox"/> Junkyards | <input type="checkbox"/> Wooded areas <input type="checkbox"/> Other (<i>describe</i>) |

Recreation

21. Is there designated public access to the stream? Is it appropriate for... (*circle and *locate on map.*)

- Canoeing Fishing Swimming Walking Bicycling Other _____

22. Are there areas which are informal or potential access points? No Yes- *Describe and *locate on map.*

WILDLIFE / HABITAT

Aquatic Species

23. Do you see fish or evidence of fish? (describe) _____
Estimate number _____. *If possible, describe species & size.* _____
Evidence of fish? (i.e. nests) _____
24. Other forms of aquatic life? (*circle, identify species if known*)
Aquatic insects Turtles Frogs Salamander Snail Mussels Snakes Clams
Other _____
Evidence of aquatic species? (i.e. eggs, tracks) _____

Riparian Habitat/Species (look along stream bank and vegetated riparian areas)

25. Animals or evidence of animals? (*circle*)
Holes Teeth marks Food storage/eating Dens Scat Footprints/tracks
Specific animals seen (or evidence of) _____
26. Wildlife habitat elements located near the stream (*check*)
 Standing dead trees
 Fallen tree limbs and trunks
 Scattered rocks and boulders
 Stone walls (without cement)
 Vines
 Springs and seeps
 Vernal pools
27. Birds? (*circle*) Herons Mallard ducks Wood ducks Kingfishers Canada geese Other _____
Evidence of birds: (i.e. nests, footprints) _____
28. Do you know if there are rare & endangered species of plants or animals in your segment? *If so, identify.*

29. Links from riparian area to other areas of wildlife habitat: (*check*)
 Wetlands adjacent to stream
 Abandoned cropland or pasture near stream
 The riparian area is vegetated with trees and/or shrubs at least 100 feet wide
 The riparian area connects to adjacent open space or greenway

Optional: Additional Questions and notes.

Adopt a Stream

These sheets are designed to give the "big picture" of your segment. They provide the basis of the narrative description of segments in the Shoreline Survey report.

NARRATIVE DESCRIPTION

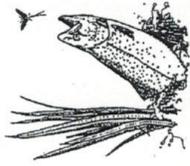
SAMPLE 1: The river flows slowly through this segment. The banks on the south side are eroded for a distance of about 100 yards (a football field), with parkland behind it. On the other side of the river, the banks have cement walls, industrial buildings and parking lots. There was a marsh at the lower end. A small stream came into the river, and the water quality seemed worse after it entered. Bits of oil floated on the water, and the stream smelled like asphalt. There were a few gulls in the industrial section, and there were turtles, a muskrat hole and a great blue heron in the wetland/marsh.

SAMPLE 2: Segment 2 flows quickly through conservation land, with several small riffles. We saw several anglers along the banks. There were many downed trees in the stream, which provide good habitat for fish. Vegetation along the stream is thick, second-growth forest with an old dirt road providing good access for walking or mountain biking. There are several old appliances in the river near the Rt. 20 bridge.

Describe your segment in a paragraph:

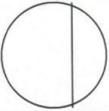
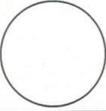
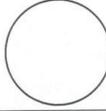
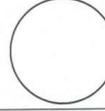
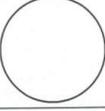
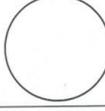
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Adopt-A-Stream Pipe Survey of _____ River/Brook

Segment # _____ Segment Begins: _____
 Date: _____ Segment Ends: _____
 Names of observers: _____
 Weather today: _____
 Weather over past 48-72 hours: _____

Pipe#	Time	Pipe material and condition	Pipe size & amount of flow	Color of Flow	Odor of Flow	Algae below pipe Yes No Describe extent	Sediment below pipe	Comments? If pipe should be rechecked- describe location	GPS Latitude GPS Longitude: (Optional)
Sample #1	9:33 AM	Concrete in good shape	 Constant Moderate Flow 1' diameter	Red-brown	fetid	Green growth coating rocks across the entire stream width and 100 yards upstream.	Sand accumulation at outfall	Should be rechecked. Downstream of Jones St. Bridge	
									
									
									
									
									

Riverways Program, Division of Ecological Restoration

Shoreline Survey Priorities for Action

Adopt a Stream

Segment Begins: _____
 Segment Ends: _____

<p><i>Look back at your Field Data sheet and include your observations. The information from these sheets will be used to develop the Action Plan. PROBLEMS:</i></p> <p>Problems found in your segment, such as: pipes discharging in dry weather erosion, runoff trash, dense algae water quality problems (odor, color, oil, foam, sewage) degraded wetlands (phragmites, loosestrife) other problems (<i>describe, give location</i>)</p> <p>1. 2.</p>	<p>ASSETS:</p> <p>Assets found in your segment, such as: Good habitat, wildlife species businesses or landowners using the river (in a friendly way) recreational access (canoe, trails, parks) potential recreational access potential park/conservation land (<i>describe, give location</i>)</p> <p>1. 2.</p>	<p>PRIORITIES for action:</p> <p>List items from problems/assets columns that you feel need more work.</p> <p>1. 2.</p>
---	---	---