Appendix 15
Connecticut River Watershed
Assessment and Listing Decision Summary

Final Massachusetts Integrated List of Waters for the Clean Water Act 2018/2020 Reporting Cycle

CN: 505.1

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Table of Contents

2018/20 Cycle Impairment Changes

Waterbody	AU_ID	2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Arcadia Lake	MA34005	5	5	(Fanwort*)		Added
Atkins Reservoir	MA34006	3	5	Mercury in Fish Tissue		Added
Bachelor Brook	MA34-07	5	5	(Water Chestnut*)		Added
Barton Cove	MA34122	5	5	(Curly-leaf Pondweed*)		Added
Barton Cove	MA34122	5	5	(Fanwort*)		Added
Barton Cove	MA34122	5	5	(Non-Native Aquatic Plants*)		Removed
Barton Cove	MA34122	5	5	(Water Chestnut*)		Added
Connecticut River	MA34-02	5	5	(Water Chestnut*)		Added
Connecticut River	MA34-04	5	5	(Water Chestnut*)		Added
Danks Pond	MA34019	3	4c	(Water Chestnut*)		Added
Forge Pond	MA34024	5	5	(Non-Native Aquatic Plants*)		Removed
Forge Pond	MA34024	5	5	(Water Chestnut*)		Added
Ingraham Brook Pond	MA34037	4c	4c	(Non-Native Aquatic Plants*)		Removed
Ingraham Brook Pond	MA34037	4c	4c	(Water Chestnut*)		Added
Lake Bray	MA34013	4c	4c	(Curly-leaf Pondweed*)		Added
Lake Bray	MA34013	4c	4c	(Non-Native Aquatic Plants*)		Removed
Lake Bray	MA34013	4c	4c	(Water Chestnut*)		Added
Lake Holland	MA34035	4c	4c	(Fanwort*)		Added
Lake Warner	MA34098	4a	4a	(Fanwort*)		Added
Lake Warner	MA34098	4a	4a	(Non-Native Aquatic Plants*)		Removed
Lake Warner	MA34098	4a	4a	(Water Chestnut*)		Added
Lampson Brook	MA34-06	5	5	Benthic Macroinvertebrates		Added
Lampson Brook	MA34-06	5	5	Dissolved Oxygen		Removed
Log Pond Cove	MA34124	5	5	(Non-Native Aquatic Plants*)		Removed
Log Pond Cove	MA34124	5	5	(Water Chestnut*)		Added
Longmeadow Brook	MA34-21	5	5	Trash		Changed
Lower Mill Pond	MA34048	4c	4c	(Non-Native Aquatic Plants*)		Removed
Lower Mill Pond	MA34048	4c	4c	(Water Chestnut*)		Added
Lower Van Horn Park Pond	MA34129	4c	4c	(Non-Native Aquatic Plants*)		Removed
Lower Van Horn Park Pond	MA34129	4c	4c	(Water Chestnut*)		Added
Manhan River	MA34-11	5	5	(Water Chestnut*)		Added
Metacomet Lake	MA34051	5	5	(Fanwort*)		Added
Mill River	MA34-24	2	5	Temperature		Added
Mill River	MA34-29	5	5	Trash		Changed
Mill River Diversion	MA34-32	3	4c	(Water Chestnut*)		Added
Nashawannuck Pond	MA34057	5	5	(Non-Native Aquatic Plants*)		Removed

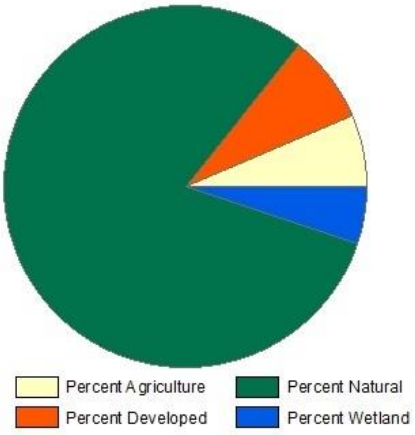
Waterbody	AU_ID	2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
Nashawannuck Pond	MA34057	5	5	(Water Chestnut*)		Added
Oxbow	MA34066	5	5	(Non-Native Aquatic Plants*)		Removed
Oxbow	MA34066	5	5	(Water Chestnut*)		Added
Oxbow Cutoff	MA34067	4c	4c	(Non-Native Aquatic Plants*)		Removed
Oxbow Cutoff	MA34067	4c	4c	(Water Chestnut*)		Added
Porter Lake	MA34073	5	5	(Curly-leaf Pondweed*)		Added
Porter Lake	MA34073	5	5	(Non-Native Aquatic Plants*)		Removed
Porter Lake West	MA34072	5	5	(Non-Native Aquatic Plants*)		Removed
Stony Brook	MA34-19	5	5	(Non-Native Aquatic Plants*)		Removed
Stony Brook	MA34-19	5	5	(Water Chestnut*)		Added
Whiting Street Reservoir	MA34101	4c	4c	(Water Chestnut*)		Added
Wilton Brook	MA34-15	5	5	(Non-Native Aquatic Plants*)		Removed
Wilton Brook	MA34-15	5	5	(Water Chestnut*)		Added

ADAMS BROOK (MA34-75)

Location:	Headwaters confluence of Nurse and Dean brooks in small "diversion pool" for Atkins Reservoir, Shutesbury to mouth at confluence with Amethyst Brook (forming headwater Fort River), Amherst.
AU Type:	RIVER
AU Size:	3.5 MILES
Classification/Qualifier:	B

ADAMS BROOK - MA34-75

Watershed Area: 11.08 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	11.08	6.84	3.61	2.08
Agriculture	6.4%	9.84%	7.07%	12.04%
Developed	7.8%	9.48%	5.07%	6.1%
Natural	80.7%	75.06%	77.9%	69.53%
Wetland	5.1%	5.61%	9.95%	12.33%
Impervious Cover	3.47%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Adams Brook (MA34-75) as a CFR and it is a designated Cold-Water stream in the proposed SWQS. MassDFG biologists conducted backpack electrofishing at three locations in August 2003 and August 2008. Two samples were collected at the upstream end of the AU in Shutesbury, upstream of Pratt Corner Rd and downstream of the Shutesbury Rd crossing (Sample IDs 2742 & 955). The third sample was collected close to the bottom of the AU at Wagner Wood off Southeast St, Amherst (Sample ID 2760). All three samples were indicative of good water quality for cold-water habitat with multiple age classes of Eastern brook trout throughout and slimy sculpin at the Wagner Wood location.

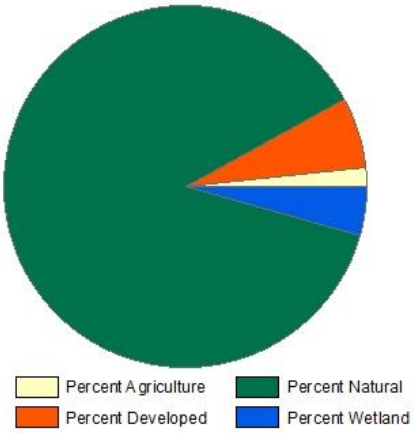
The Aquatic Life Use for Adams Brook is assessed as Fully Supporting based on the fish population data.

Amethyst Brook (MA34-35)

Location:	Headwaters, confluence of Buffum and Harris brooks, Pelham to mouth at confluence with Adams River (forming headwaters Fort River), Amherst.
AU Type:	RIVER
AU Size:	2.1 MILES
Classification/Qualifier:	B

Amethyst Brook - MA34-35

Watershed Area: 9.36 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	9.36	4.51	3.29	1.51
Agriculture	1.7%	2.3%	1.7%	1.9%
Developed	6.3%	10%	5.3%	8.8%
Natural	87.7%	86.4%	85.2%	87.9%
Wetland	4.3%	1.2%	7.8%	1.4%
Impervious Cover	2.5%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in Amethyst Brook in October 2008, downstream of the Bartlett Fishrod Company dam (removed in 2012), behind HRD Press on Pelham Rd (Sample ID 2591). MassDFG lists Amethyst Brook as a CFR and while it is currently not a designated Cold-Water stream in the SWQS, it needs to be protected as a Tier 1 Cold Water existing fishery, since multiple age classes of Eastern brook trout and slimy sculpin were collected. MassDEP staff conducted water quality monitoring off the end of Allen Mill Road, Amherst (W1783), during the summer of 2008 (n=5). All data were indicative of good water quality. Attended probes: pH ranged from 6.0-7.0SU (3 times falling below 6.5SU but never falling below 6.0SU); maximum temperature 19.0°C; minimum DO 8.8mg/L and maximum saturation 101%. The seasonal average total phosphorus was 0.008mg/L (maximum 0.014 mg/L). There were no observations of dense/very dense filamentous algae present. MassDEP biologists also collected a benthic macroinvertebrate sample (Sample ID B0514) upstream from the swale off the end of Allen Mill Road, Amherst, in July 2008. This was the benthic reference site in 2008 so considered representative of excellent conditions.

The Aquatic Life Use of Amethyst Brook is assessed as Fully Supporting based on the benthic, fish and water quality data collected during the summer of 2008.

Arcadia Lake (MA34005)

Location:	Belchertown.
AU Type:	FRESHWATER LAKE
AU Size:	32 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fanwort*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The MassDEP 1998 synoptic survey identified infestations of the non-native aquatic macrophytes, *Myriophyllum heterophyllum* (Variable-leaf milfoil) and *Cabomba caroliniana* (Fanwort), in Arcadia Lake. The Aquatic Life Use of Arcadia Lake will continue to be assessed as Not Supporting due to the presence of Non-Native Aquatic Plants with the species-specific fanwort impairment being added.

Atkins Reservoir (MA34006)

Location:	Shutesbury/Amherst.
AU Type:	FRESHWATER LAKE
AU Size:	46 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	5	Mercury in Fish Tissue		Added

Fish, other Aquatic Life and Wildlife Use: Not Assessed

No data are available to assess the Aquatic Life Use for Atkins Reservoir so it is Not Assessed.

Fish Consumption Use: Not Supporting

MassDEP biologists conducted fish toxics sampling at Atkins Reservoir in June and July 2016 as part of the probabilistic lake surveys (MAP2). Because of elevated mercury measured in fish filets, MassDPH issued the following fish consumption advisories:

- *"Children younger than 12 years of age, pregnant women, women of childbearing age who may become pregnant, and nursing mothers should not eat any fish from this water body."*
- *"The general public should limit consumption of all fish from this water body to two meals per month."*

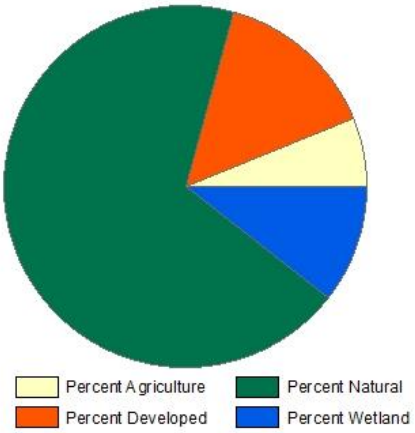
Since there is a site specific DPH advisory for elevated mercury in fish tissue, the Fish Consumption Use for Atkins Reservoir (MA34006) is assessed as Not Supporting. The likely source, although not confirmed, is atmospheric deposition. Data Source: (MassDPH 2019)

Bachelor Brook (MA34-07)

Location:	Outlet Forge Pond, Granby to mouth at confluence with Connecticut River, South Hadley (through former 2006 segments: Aldrich Lake [East Basin] MA34002 and Aldrich Lake [West Basin] MA34106).
AU Type:	RIVER
AU Size:	11.5 MILES
Classification/Qualifier:	B: WWF

Bachelor Brook - MA34-07

Watershed Area: 31.53 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	31.52	6.79	8.22	1.78
Agriculture	6.1%	7.8%	6%	5%
Developed	14.6%	11.8%	11.2%	5.7%
Natural	68.8%	69.8%	60.1%	64.6%
Wetland	10.5%	10.5%	22.7%	24.7%
Impervious Cover	4.7%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

There is a record in the USGS Nonindigenous Aquatic Species database of *Trapa natans* (Water Chestnut) located near the mouth of Bachelor Brook. Additionally it should be noted that an infestation of Water Chestnut exists in Forge Pond, which lies immediately upstream of Bachelor Brook. Records of this invasive at either end of the AU suggests the Water Chestnut will be found throughout the length of the brook at this point. MassDEP staff conducted water quality monitoring in Bachelor Brook at Rt.47 Hadley Street, South Hadley (W1052) during the summer of 2008. All data were indicative of good water quality, supportive of a warm water fishery. Five-day unattended continuous probe deployments for DO and temperature in May, June and July recorded a minimum DO concentration of 6.73mg/L (with mean minimum DO concentrations ranging from 7.12-7.93mg/L); a maximum DO saturation of 103.8%, a max diel shift of 1.33mg/L and a maximum temperature of 24.5°C. Attended probes (n=6): pH ranged from 6.9-7.3SU; maximum temperature 22.4°C; minimum DO 7.9mg/L and maximum saturation 99%. The seasonal average total phosphorus concentration was 0.039mg/L (maximum 0.056mg/L). There were no observations of dense/very dense filamentous algae noted either.

The Aquatic Life Use of Bachelor Brook is assessed as Not Supporting due to an infestation of the non-native aquatic macrophyte *Trapa natans* (water chestnut). The other water quality data collected during the summer of 2008 were indicative of good conditions.

Barton Cove (MA34122)

Location:	Gill (cove of Connecticut River upstream of Turners Falls dams (NATID: MA00848 and MA00849)).
AU Type:	FRESHWATER LAKE
AU Size:	160 ACRES
Classification/Qualifier:	B: WWF (cove on river designated B/WWF)

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Curly-leaf Pondweed*)		Added
5	5	(Fanwort*)		Added
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

MassDEP staff reported infestations of the following non-native aquatic macrophytes in Barton Cove in 1998: *Myriophyllum spicatum* (Eurasian Water Milfoil), *Potamogeton crispus* (Curly-leaf Pondweed), and *Cabomba caroliniana* (Fanwort). Isolated patches of *Trapa natans* (Water Chestnut) were observed near Barton Cove by Silvio O. Conte National Fish and Wildlife Refuge staff. Since that time five records of *Trapa natans* were noted in Barton Cove between 2009 and 2016 on the USGS Nonindigenous Aquatic Species website.
The Aquatic Life Use of Barton Cove will continue to be assessed as Not Supporting due to the presence of Eurasian Water Milfoil (*Myriophyllum Spicatum*) while the generic Non-Native Aquatic Plants impairment was delisted and the species specific impairments for Fanwort (*C. caroliniana*), Curly-leaf Pondweed (*P. crispus*) and Water Chestnut (*T. natans*) were added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophytes Fanwort (C. caroliniana), Curly-leaf Pondweed (P. crispus) and Water Chestnut (T. natans).

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

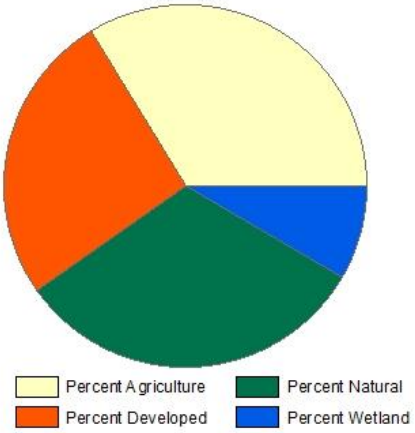
Barton Cove has infestations of multiple non-native aquatic macrophyte species. The MassDEP 1998 synoptic survey recorded the presence of *Myriophyllum spicatum*, *Potamogeton crispus*, and *Cabomba caroliniana* (MassDEP 1998). Additionally, five records of *Trapa natans* are noted (2009-2016) on the USGS Nonindigenous Aquatic Species website, which informs the MassDEP Freshwater Aquatic Invasive Species database (MassDEP Undated). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophytes Fanwort (C. caroliniana), Curly-leaf Pondweed (P. crispus) and Water Chestnut (T. natans).

Bloody Brook (MA34-36)

Location:	Headwaters, perennial portion, from the railroad tracks north of North Main Street, Deerfield to mouth at confluence with Mill River, Whately.
AU Type:	RIVER
AU Size:	3.7 MILES
Classification/Qualifier:	B

Bloody Brook - MA34-36

Watershed Area: 5.65 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	5.65	4.78	1.50	1.27
Agriculture	33.7%	33.5%	38%	36.1%
Developed	26%	28.6%	25.2%	28.2%
Natural	31.8%	28.9%	23.2%	20.8%
Wetland	8.4%	9%	13.6%	14.9%
Impervious Cover	8.7%			

Fish, other Aquatic Life and Wildlife Use: Not Supporting

MassDFG biologists conducted backpack electrofishing in Bloody Brook upstream of the Pleasant Street crossing along North Main Street in Deerfield in July and August 2007 (SampleID's 2419 & 2140). These samples were both indicative of reasonable conditions for a low gradient stream as they were both dominated by moderately tolerant fluvial specialist and dependant species moderately tolerant to pollution. MassDEP staff conducted water quality monitoring in Bloody Brook at Whately Rd, Deerfield (W1063) during the summer of 2008. During the five-day unattended continuous probe deployments for DO and temperature in May, June and July a minimum DO of 0.2mg/L was recorded (mean minimum DOs were low ranging from 0.20 to 2.8mg/L), the maximum DO saturation was 65%, the max diel shift was high (4.75mg/L however the large shifts were associated with increased streamflow as a result of storm events), and the maximum temperature was 21.2°C. The attended probe data can be summarized as follows: pH ranged from 6.0-6.4SU; maximum temperature 20.2°C; minimum DO 0.3mg/L, maximum saturation 61%. The seasonal average total phosphorus concentration was 0.089mg/L (maximum 0.12mg/L). No observations of dense/very dense filamentous algae were noted. Flows were described as stagnant during three of the five surveys.

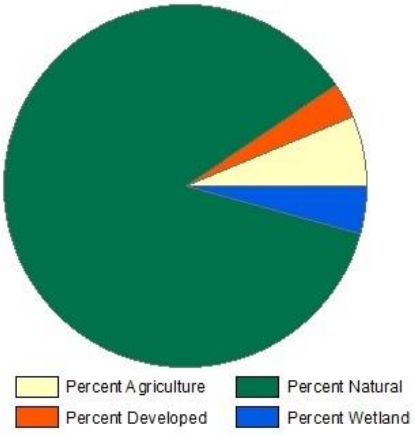
The Aquatic Life Use for Bloody Brook will continue to be assessed as Not Supporting with the dissolved oxygen and total phosphorus impairments being carried forward.

BRADFORD BROOK (MA34-71)

Location:	Headwaters east of Williamsburg Road, Ashfield to mouth at confluence with East Branch Mill River, Williamsburg.
AU Type:	RIVER
AU Size:	4 MILES
Classification/Qualifier:	B

BRADFORD BROOK - MA34-71

Watershed Area: 3.97 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.79	3.47	0.84	0.78
Agriculture	6.3%	6.68%	5.35%	5.81%
Developed	3.1%	3.25%	4.31%	4.32%
Natural	86.4%	85.78%	84.03%	83.82%
Wetland	4.2%	4.29%	6.31%	6.06%
Impervious Cover	1.67%			

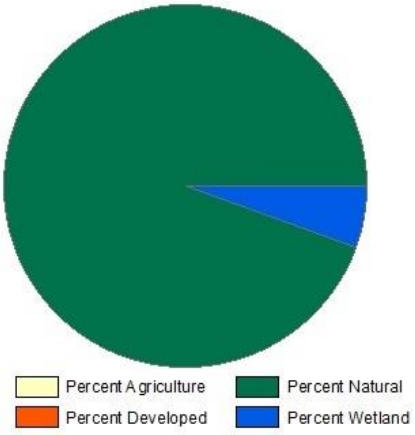
Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
MassDFG lists Bradford Brook as a CFR and it is a designated Cold-Water stream in the proposed SWQS. MassDFG biologists conducted backpack electrofishing at one location upstream of the Williamsburg Rd crossing, Ashfield in July 2007 (SampleID 2110). The sample was comprised of multiple age classes of Eastern brook trout. It should be noted that DFG biologists noted the stream was full of silt and was barely flowing. The Aquatic Life Use of Bradford Brook is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout. An alert is being identified for the habitat concerns (low flow and siltation) noted by DFG biologists.

BREWER BROOK (MA34-69)

Location:	Headwaters south of Route 143 in the southwest corner of Williamsburg to mouth at confluence with Roberts Meadow Brook, Westhampton.
AU Type:	RIVER
AU Size:	2.3 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

BREWER BROOK - MA34-69

Watershed Area: 2.24 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.24	2.24	0.29	0.29
Agriculture	0.7%	0.66%	0%	0%
Developed	0.7%	0.69%	1.27%	1.27%
Natural	93.3%	93.29%	76.32%	76.32%
Wetland	5.4%	5.36%	22.41%	22.41%
Impervious Cover	0.31%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Brewer Brook as a CFR though it is not currently designated as Cold Water in the SWQS. MassDFG biologists conducted backpack electrofishing at one location close to the bottom of the AU at Chesterfield Rd, Westhampton in August 2006 (SampleID 1989). The sample dominated by multiple age classes of Eastern brook trout as well as slimy sculpin.

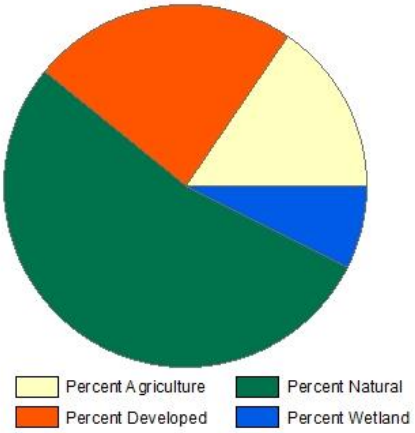
The Aquatic Life Use of Brewer Brook is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout and slimy sculpin.

Brickyard Brook (MA34-13)

Location:	Headwaters, perennial portion, Westfield to mouth at confluence with Manhan River, Westfield.
AU Type:	RIVER
AU Size:	1.6 MILES
Classification/Qualifier:	B

Brickyard Brook - MA34-13

Watershed Area: 3.08 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.08	3.08	0.69	0.69
Agriculture	15.4%	15.4%	10.4%	10.4%
Developed	23.8%	23.8%	19.8%	19.8%
Natural	53.4%	53.4%	50.8%	50.8%
Wetland	7.4%	7.4%	19.1%	19.1%
Impervious Cover	9%			

Fish, other Aquatic Life and Wildlife Use: Not Assessed

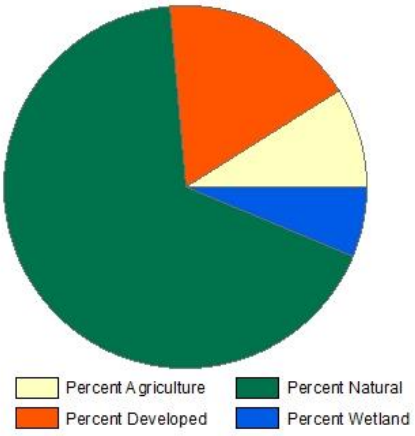
DFG biologists attempted backpack electrofishing in Brickyard Brook in September 2009 downstream from Buck Pd Rd crossing in Westfield. Their notes stated the following: Old beaver swamp. Made the effort, sunk in mud amongst broken bottles & various discareded power tools. Shocked a couple of spots. No fish observed.
Since no data are available to assess the Aquatic Life Use for Brickyard Brook, it is Not Assessed.

Broad Brook (MA34-18)

Location:	Headwaters, Holyoke to mouth at inlet Nashwauk Pond, Easthampton.
AU Type:	RIVER
AU Size:	9.3 MILES
Classification/Qualifier:	B: CWF

Broad Brook - MA34-18

Watershed Area: 6.23 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	6.23	3.90	1.35	0.82
Agriculture	8.9%	8%	9.4%	9.8%
Developed	17.5%	17.2%	11.9%	13.4%
Natural	67.3%	68.4%	59.1%	57.6%
Wetland	6.3%	6.5%	19.6%	19.1%
Impervious Cover	5.7%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in Broad Brook at Rock Valley Rd just South of Mountain Rd (SampleID 4724) and just south of Keyes Rd in Holyoke (Sample ID 4723) in September 2013. Both samples were dominated by fluvial specialist/dependant species including multiple age classes of Eastern Brook trout. A few slimy sculpins were also present at the most upstream location.

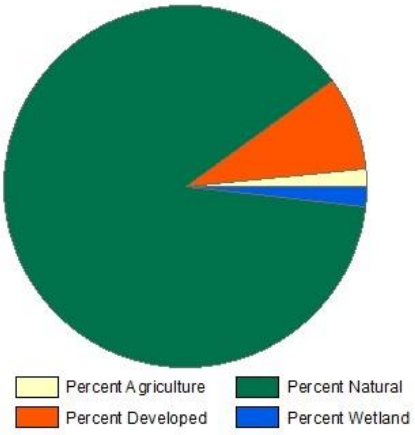
The Aquatic Life Use of Broad Brook is assessed as Fully Supporting based on fish community data supportive of good cold-water habitat (multiple age classes of brook trout and slimy sculpin).

BUFFUM BROOK (MA34-49)

Location:	Headwaters, west of West Pelham Road, Shutesbury to mouth at confluence with Harris Brook, (forming headwaters Amethyst Brook), Pelham (variant name: Buffam Brook).
AU Type:	RIVER
AU Size:	3.1 MILES
Classification/Qualifier:	B: CWF

BUFFUM BROOK - MA34-49

Watershed Area: 2.17 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.17	2.17	0.83	0.83
Agriculture	1.5%	1.45%	0.98%	0.98%
Developed	8.4%	8.42%	11.37%	11.37%
Natural	88.3%	88.3%	84.97%	84.97%
Wetland	1.8%	1.82%	2.68%	2.68%
Impervious Cover	3.37%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG lists Buffum Brook (MA34-49) as a CFR and it is also a designated Cold-Water stream in the proposed SWQS. MassDFG biologists conducted backpack electrofishing downstream of the North Valley Road crossing in Pelham (Sample ID 949) in August 2003. The sample was dominated by multiple age classes of Eastern brook trout.

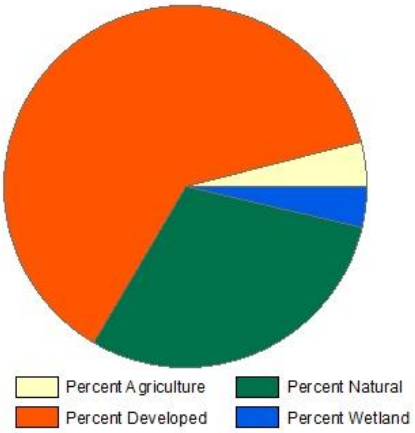
Too limited data are available to assess the Aquatic Life Use of Buffum Brook, so it is assessed as having Insufficient Information (fish data are too dated to make assessment decision).

Buttery Brook (MA34-42)

Location:	Headwaters (perennial portion), west of Haig Avenue, South Hadley to mouth at confluence with the Connecticut River, South Hadley (interrupted urban, approximately 1200 feet culverted).
AU Type:	RIVER
AU Size:	1.6 MILES
Classification/Qualifier:	B: CSO

Buttery Brook - MA34-42

Watershed Area: 3.16 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.16	3.16	0.61	0.61
Agriculture	4%	4%	6.9%	6.9%
Developed	62.6%	62.6%	44.6%	44.6%
Natural	29.8%	29.8%	41.9%	41.9%
Wetland	3.6%	3.6%	6.7%	6.7%
Impervious Cover	22.6%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDEP staff deployed two thermistors in Buttery Brook during the summer of 2008 bracketing the dicharges of non-contact cooling water (outfalls 001 and 007) by the InteliCoat facility (NPDES MAG250968). The upstream location was just downstream of Gaylord Street, South Hadley (W2060) and the downstream location was ~ 500ft downstream of Gaylord Street, South Hadley (W2061). No thermal impacts were found: maximum temperatures 24.5/24.6°C, maximum 7DADM 23.3/23.1°C, and maximum 24-hour rolling average 22.3/22.2°C upstream/downstream, respectively. There were no exceedances of acute or chronic temperature criteria for warm water at any time.

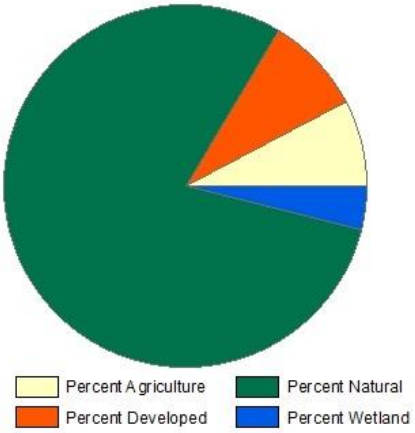
There is insufficient information to assess the Aquatic Life Use of Buttery Brook, so it is being assessed as having Insufficient Information. No thermal impacts were documented by the non-contact cooling water discharge from InteliCoat (MAG250968).

Connecticut River (MA34-01)

Location:	New Hampshire/Massachusetts state line, Northfield to Route 10 bridge, Northfield.
AU Type:	RIVER
AU Size:	3.5 MILES
Classification/Qualifier:	B: WWF

Connecticut River - MA34-01

Watershed Area: 464.82 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	25.60	8.89	4.94	2.16
Agriculture	7.7%	18.4%	7.6%	15.3%
Developed	8.7%	19.3%	5.5%	8.6%
Natural	79.8%	58.8%	78.4%	71.9%
Wetland	3.8%	3.5%	8.5%	4.2%
Impervious Cover	2.8%			

Fish, other Aquatic Life and Wildlife Use: Not Supporting

A mussel survey conducted in 2012 along this Connecticut River AU (MA34-01) documented adequate mussel habitat and species. MassDEP staff conducted water quality monitoring in the river ~800 feet north of the Route 10 bridge, Northfield (W1799), during the summer of 2008. The minimum DO was 7.9mg/L during the five-day unattended probes deployments in May, June and July (mean minimum DO ranged from 8.2 to 9.1mg/L over the three deploys), maximum saturation was 114%, the maximum diel DO shift was 0.8mg/L, and the maximum temperature was 22.5°C. During the long term (76-day) temperature logger deployment, the maximum temperatue was 26.8°C (maximum 7 DADM of 26.4°C, maximum 24-rolling mean 26.3°C). Discrete pH data ranged from 7.1 to 7.4SU (n=6). All these data were indicative of good conditions. River water was also collected at the Pauchaug boat launch, Northfield for use as dilution water in the Town of Northfield Wastewater Treatment Facility (MA0100200) toxicity tests. Between May 2008 and August 2017 survival of *C.dubia* exposed (~48 hours) to the river water was good (≥95%) (n=12 tests). No acute whole effluent toxicity was detected to *C. dubia* during 9 of the 12 Town of Northfield WWTF tests (outfall 001). The LC_{50}s <50% effluent in two tests (September 2013 with LC_{50} 36.9% effluent and August 2016 with LC_{50} 43.3% effluent). The August 2015 test result was 61.6% effluent (meeting the permit limit of 50% effluent).

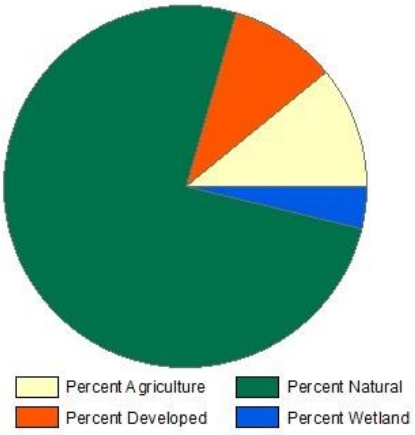
The Aquatic Life Use of this Connecticut River AU (MA34-01) will continue to be assessed as Not Supporting. Although the water quality data collected were indicative of good conditions the historical impairments "flow modification" and "stream bank alteration" due to issues with bank erosion and the operation of multiple hydroelectric generating facilities along the Connecticut River are being carried forward.

Connecticut River (MA34-02)

Location:	Route 10 bridge, Northfield to Turners Falls dams (NATID: MA00848 and MA00849), Gill/Montague (excluding the delineated segment; Barton Cove MA34019).
AU Type:	RIVER
AU Size:	11.4 MILES
Classification/Qualifier:	B: WWF

Connecticut River - MA34-02

Watershed Area: 508.75 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	69.51	10.15	16.05	2.87
Agriculture	10.8%	5.5%	10.8%	6.2%
Developed	9.7%	15.3%	7.6%	11.1%
Natural	75.8%	76.4%	73.9%	76.6%
Wetland	3.7%	2.8%	7.7%	6.1%
Impervious Cover	3.5%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

Silvio O. Conte National Fish and Wildlife Refuge staff reported an infestation of the non-native aquatic macrophyte, *Trapa natans* (Water Chestnut), in this Connecticut River AU (MA34-02), along the shoreline just upstream from Barton Cove. A mussel survey conducted in 2012 along this Connecticut River AU (MA34-02) documented adequate mussel habitat and species. Water from the river was collected roughly 1,600 feet upstream of the Northfield Mount Hermon School WWTF discharge from their boat docks for use as a diluent/control in the facility's whole effluent toxicity tests Survival of *C. dubia* exposed (~48 hours) to the river water was excellent (100%, n=10). Between September 2008 and September 2017, ten valid WET tests were conducted on the Northfield Mount Hermon School WWTF (MA0032573) effluent using *C. dubia*. The LC_{50}s were all >100% effluent.

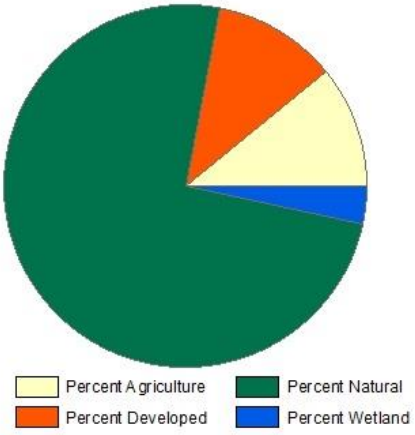
The Aquatic Life Use of this Connecticut River (MA34-02) will continue to be assessed as Not Supporting. The historical impairments "flow modification" and "stream bank alteration" are being carried forward and a new impairment for the non-native aquatic macrophyte Water Chestnut (*Trapa natans*) is being added.

Connecticut River (MA34-03)

Location:	Turners Falls dams (NATID: MA00848 and MA00849), Gil/Montague to confluence with Deerfield River, Greenfield/Deerfield.
AU Type:	RIVER
AU Size:	3.7 MILES
Classification/Qualifier:	B: WWF, CSO

Connecticut River - MA34-03

Watershed Area: 545.74 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	94.82	6.19	22.19	1.97
Agriculture	10.9%	1.7%	11.7%	0.9%
Developed	11%	35.4%	9.4%	19.2%
Natural	74.6%	59.3%	71.7%	74.3%
Wetland	3.4%	3.7%	7.2%	5.5%
Impervious Cover	3.9%			

Fish, other Aquatic Life and Wildlife Use: Not Supporting

The Southworth Paper Company was permitted (MA0005011) to discharge to this (MA34-03) segment of the Connecticut River. River water was collected from the Turners Falls Power Canal for use as diluent in the facility's WET tests. Survival of *C. dubia* exposed (~48 hours) to the river water was good (≥85%, n=43). Between December 2007 and June 2017, 42 valid acute WET tests were conducted on the Southworth Company Turners Falls Mill effluent using *C. dubia*. Acute toxicity was detected in about half of the tests conducted but did not meet the LC_{50}s permit limit ≥50% effluent in six tests including October and December 2008 tests (LC_{50} 15.52% and 41.7%, respectively), February and October 2009 (LC_{50} = 38% and 35.4%, respectively), December 2014 (LC_{50} = 40.6%), and June 2015 (LC_{50} = 33.6%). The Southworth Paper Company, however, is no longer in business. Midwest Biodiversity Institute biologists conducted boat electrofishing at three locations August/September 2009, just downstream of the Turners Falls dam (SampleID 3282) approximately 0.5miles downstream of Turners Falls Rd bridge (Sample ID's 3283 & 3267). While not used specifically in the assessment decision it is noted that moderately tolerant macrohabitat generalists dominated the samples. A mussel survey conducted in 2012 along this Connecticut River AU (MA34-03) documented adequate mussel habitat and species. Further downstream USGS staff conducted limited nutrient sampling in the river at Main Street, NR Greenfield Montague City Road bridge just upstream of the confluence with the Deerfield River - lat/longs 42.5805556/-72.5797222) in April and August 2005. Total phosphorus was low (0.02-0.06mg/L) as were both ammonia-nitrogen and chloride levels.

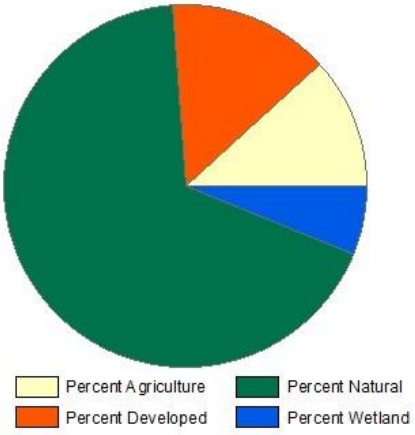
The Aquatic Life Use of this Connecticut River AU (MA34-03) will continue to be assessed as Not Supporting with the "flow regime modification" "dewatering" and "TSS" impairments being carried forward.

Connecticut River (MA34-04)

Location:	Confluence with Deerfield River, Greenfield/Deerfield to Holyoke Dam (NATID: MA00973), Holyoke/South Hadley.
AU Type:	RIVER
AU Size:	34.5 MILES
Classification/Qualifier:	B: WWF, CSO

Connecticut River - MA34-04

Watershed Area: 988.22 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	537.22	13.38	132.67	3.16
Agriculture	11.7%	6.3%	12.1%	7.3%
Developed	14.4%	39.6%	11.1%	21.3%
Natural	67.8%	46.7%	64.3%	59.4%
Wetland	6.1%	7.4%	12.6%	12%
Impervious Cover	5.3%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting (Alert)
There are infestations of the non-native aquatic macrophyte, *Trapa natans*, in Hadley Cove, Hadley, between Log Pond Cove and the Holyoke Dam (Holyoke), and also at the mouth of the Manhan River, which discharges to this Connecticut River AU (MA34-04). Additionally, there are reports of *Potamogeton crispus* (Curly-leaf Pondweed) near the LeFleur Airport (Northampton) and just upstream of the Montague-Sunderland-Deerfield border, but confirmation is needed. Midwest Biodiversity Institute biologists conducted boat electrofishing at two locations near the top of the AU in September and October 2009. Two samples were collected one just downstream of the confluence of Deerfield River, Montague/Deerfield (SampleID 3270) and one about a mile downstream of the railroad track and East Deerfield (SampleID 3268). MassDFG biologists conducted seine netting sampling in the river in September 2003, upstream of Oxbow ramp, Easthampton (SampleID 1458). The samples were all dominated by moderately tolerant macrohabitat generalist species. USGS staff conducted limited nutrient sampling in the Connecticut River at the Rail Trail Bridge, Montague (just downstream of confluence with Deerfield River) between October 2006 and September 2007. The seasonal (May through September 2007) average of total phosphorus including both sampling methodologies was low (0.021mg/L). MassDEP staff conducted water quality monitoring at two locations during the summer of 2008; at the Rt.116 bridge crossing in Deerfield/Sunderland (W1045) and approximately 450 feet downstream from Route 9 bridge,

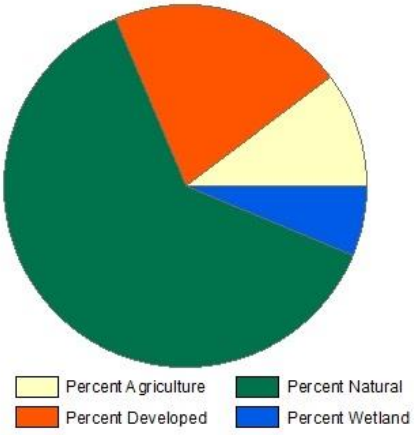
Hadley (W1784). At the upstream site (W1045) the minimum DO concentration (n=5) was 8.0mg/L, maximum saturation 105%, maximum temperature was22.3°C, pH ranged from 7.0 to 7.3SU (n=4), and the seasonal average total phosphorus concentration was low (0.018 mg/L, maximum 0.025 mg/L) Further downstream at W1784 the minimum DO was 7.9mg/L during the five-day probe deployments in May, June and July (mean minimum DO ranged from 8.0 to 8.7mg/L over the three deploys), the maximum DO saturation was 107%, the maximum diel DO shift was 0.7mg/L, the maximum temperature was 23°C. During the long term (69-day) temperature logger deployment, the maximum temperature was 27.9°C (maximum 7 DADM 27.6°C, maximum 24-hour rolling average 27.2°C). Discrete pH measurements ranged from 6.9-7.3SU (n=6). The towns of Montague, South Deerfield, Sunderland, Amherst, Hatfield, Hadley, Northampton, and Easthampton discharge municipal wastewater to this Connecticut River AU (MA34-04). Survival of *C. dubia* or *P. promelas* exposed to river water collected for use as dilution water in the facility's WET tests was ≥80%. With rare exception these facilites were also in compliance with their acute WET tests using either C. dubia or P. promelas between March 2008 and September 2018. Chang Farms (which ceased to discharge to Sugarloaf Brook in 2007 and began to discharge treated process water to the Connecticut River downstream from Route 116, Whatley) had occasional acute toxicity in their effluent (June 11, 12, and 13). The Mount Tom Coal-fired Station was closed in 2014.
The Aquatic Life Use of Connecticut River (MA34-04) is assessed as Not Supporting due to an infestation of the non-native *Trapa natans* (Water Chestnut). The former alert for the *T. natans* infestation is being removed, the former alert for fish tissue contaminants and the risk they pose to fish-eating wildlife will remain, and a new alert for a potential infestation of *Potamogeton crispus* (Curly-leaf pondweed) is being added.

Connecticut River (MA34-05)

Location:	Holyoke Dam (NATID: MA00973), Holyoke/South Hadley to Massachusetts/Connecticut border, Longmeadow.
AU Type:	RIVER
AU Size:	15.9 MILES
Classification/Qualifier:	B: WWF, CSO

Connecticut River - MA34-05

Watershed Area: 1081.15 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	627.21	12.11	151.66	3.84
Agriculture	10.3%	5.4%	10.8%	2.5%
Developed	21%	48.7%	14.1%	30.4%
Natural	62.5%	32.7%	62.1%	46%
Wetland	6.2%	13.2%	13%	21.1%
Impervious Cover	8.3%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)
There are reports of the non-native aquatic macrophyte, Potamogeton crispus (Curly-leaf pondweed), just downstream of the Holyoke Dam, as well as upstream of the Route 116 bridge in Holyoke. Species confirmation still needs to be made by MassDEP staff. Kleinschmidt consultant personnel conducted backpack electrofishing and boat shocking at nine transects between Holyoke Dam and the Rt.116 bridge in Aug. 2004 (SampleID's 3987, 3984, 3990, 3986, 3983, 3989, 3985, 3982, 3988). The samples were dominated by moderately and/or tolerant macrohabitat generalist species although some fluvial species were also present. It should be noted that this would be the area that one would expect to see hardest hit by the former "Gas works" operations The former Gas Works once occupied a 2-acre peninsula on the Connecticut River 1500 ft downstream from the Holyoke Dam. Historic operations resulted in large releases of tar and oil to soil, groundwater, sediment, and surface water. Remediation of coal tar patches was carried out between 2002 and 2006, but it was suspected that as many as 30 additional acres of tar could still be present. In May 2012 a "Final Restoration Plan and Environmental Assessment" was published, addressing natural resources, injured, lost or destroyed due to releases of hazardous substances in areas at or impacted by release from the Holyoke Coal Tar Site. The Final RP/EA identified and evaluated several alternatives to restore the natural resources because of injury at the Site. Three restoration projects were funded: 1) Bartlett Fish Rod Company Dam removal, 2) Manhan Dam fishway installation, and, 3) Benthic mussel surveys, CT river mainstem. The towns of South Hadley, Holyoke, Chicopee, and Springfield are permitted to discharge treated municipal wastewater to MA34-05. Survival of C. dubia, S. fontalis, O. mykiss, and P. promelas exposed (48-hours) to river water collected for use in these facility's WET tests between Mar. 2008 and Sep. 2018 was always good (>90%). While the Chicopee WPCF experienced episodic acute whole effluent toxicity in some tests (26% had LC50's<100% effluent), the other

facilities were almost always in compliance with their WET testing limits. Upgrades and improved treatment, however, have been implemented at the Chicopee WPCF including a new aeration system and improvements to the secondary clarifiers in 2018, plans to pilot use of a new coagulant in the secondary clarifiers, and the extensive and ongoing efforts regarding CSO abatement (reduction in the number of CSOs outfalls from 42 in 1988 to 18 as of Dec. 2018). MassDEP staff also conducted some limited water quality monitoring in the river at the USGS flow gaging station #01184000 downstream of Route 190, Suffield/Enfield Connecticut during the summer of 2008. The minimum DO was 8.3mg/L, the maximum saturation was 107%, the maximum temperature was 23.8, and pH ranged from 6.8 to 7.4SU (n=4). The seasonal average total phosphorus concentration was low (0.035mg/L, maximum 0.04mg/L). No observations of dense/very dense filamentous algae noted. CRC staff reported on additional infestations of Hydrilla verticillata, Eurasian watermilfoil (Myriophyllum spicatum), and curlyleaf pondweed in the river near the MA/CT border which also need confirmation.

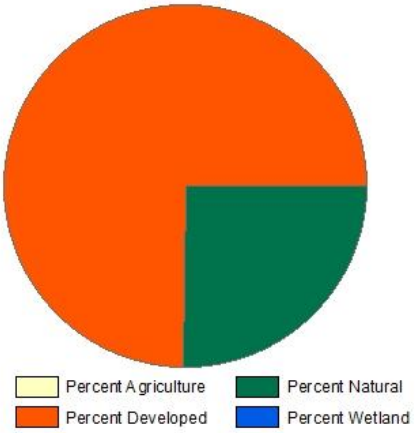
The Aquatic Life Use of MA34-05 is assessed as Fully Supporting based on the relatively good fish community in this warm water river close to the former Gas Works Site, the good survival of test exposed to the river between Mar. 2008 and Sep. 2018, and the good water quality conditions documented during the summer of 2008. An Alert is being identified because of the potential infestation of non-native aquatic macrophytes including P. crispus, M. spicatum, and H. verticillata. The former alert associated with the risk that fish tissue contaminants pose to fish-eating wildlife is being carried forward and the alert for potential toxicity/habitat impacts of coal tar deposits is being removed.

Cooley Brook (MA34-20)

Location:	Headwaters, Longmeadow to mouth at confluence with Connecticut River, Longmeadow.
AU Type:	RIVER
AU Size:	1.4 MILES
Classification/Qualifier:	B

Cooley Brook - MA34-20

Watershed Area: 0.75 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.75	0.75	0.18	0.18
Agriculture	0.1%	0.1%	0.5%	0.5%
Developed	74%	74%	33.5%	33.5%
Natural	24.9%	24.9%	62.5%	62.5%
Wetland	0.9%	0.9%	3.4%	3.4%
Impervious Cover	24.7%			

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Cooley Brook so it is Not Assessed.

Cranberry Pond (MA34018)

Location:	Sunderland.
AU Type:	FRESHWATER LAKE
AU Size:	28 ACRES
Classification/Qualifier:	B

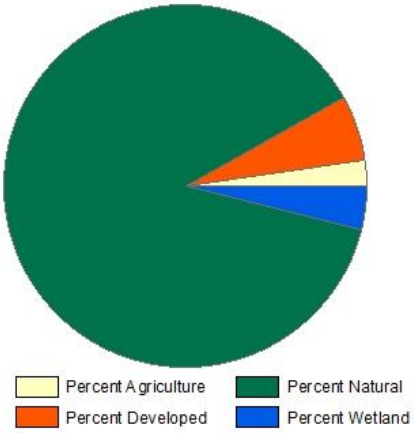
Fish, other Aquatic Life and Wildlife Use: Not Supporting
MassDEP staff reported an infestation of the non-native aquatic macrophyte *Myriophyllum spicatum* (Eurasian Water Milfoil) in Cranberry Pond during the 1998 synoptic survey. No other recent data area available. The Aquatic Life Use of Cranberry Pond will continue to be assessed as Not Supporting with the Eurasian Water Milfoil, Myriophyllum Spicatum impairment being carried forward.

Cushman Brook (MA34-34)

Location:	Headwaters, outlet Atkins Reservoir, Shutesbury to mouth at inlet Factory Hollow Pond, Amherst.
AU Type:	RIVER
AU Size:	2.5 MILES
Classification/Qualifier:	B

Cushman Brook - MA34-34

Watershed Area: 16.62 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	16.62	5.70	5.55	1.95
Agriculture	2.3%	4.6%	3.1%	5.2%
Developed	5.8%	9.1%	4.9%	7.9%
Natural	88%	81.6%	84.7%	78.1%
Wetland	3.9%	4.7%	7.3%	8.8%
Impervious Cover	2.7%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in the upper reaches of Cushman Brook just below Atkins Reservoir at January Hills Rd, Shutesbury in August 2008 (SampleID 2754) and just off E. Leverett Rd, Amherst in July 2007 (Sample ID 2101). These samples were both indicative of excellent habitat. Multiple age classes of Eastern brook trout were present in both samples and brown trout and other fluvial specialist species were well represented in the downstream sample as well. MassDFG lists Cushman Brook as a CFR though it is currently not a designated Cold-Water stream in the SWQS. MassDEP biologists also collected a benthic macroinvertebrate sample (Sample ID B0508), further downstream ~300m upstream from Factory Hollow Pond and State Street, Amherst, in July 2008. The RBPIII status of the sample was “Slightly Impaired”, with 75% comparability to the Amethyst Brook reference station (B0514).

The Aquatic Life Use for Cushman Brook (MA34-34) is assessed as Fully Supporting based on the good biological condition (benthic and fish samples both indicative of excellent conditions).

Danks Pond (MA34019)

Location:	Northampton/Easthampton.
AU Type:	FRESHWATER LAKE
AU Size:	3 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	4c	(Water Chestnut*)		Added

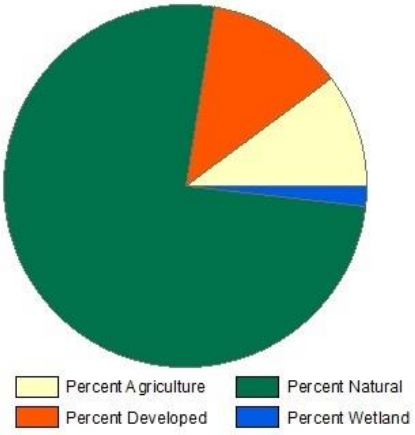
Fish, other Aquatic Life and Wildlife Use: Not Supporting
There is a reported infestation of the non-native aquatic macrophyte, *Trapa natans* (water chestnut), in Danks Pond. The Aquatic Life Use of Danks Pond is assessed as Not Supporting because of the infestation of the non-native aquatic macrophyte *Trapa natans* (water chestnut).

DAY BROOK (MA34-67)

Location:	Headwaters southwest of Miller Hill, Williamsburg to mouth at confluence with unnamed tributary to Mill River, Northampton.
AU Type:	RIVER
AU Size:	1.7 MILES
Classification/Qualifier:	B

DAY BROOK - MA34-67

Watershed Area: 0.72 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.72	0.72	0.21	0.21
Agriculture	10.1%	10.09%	1.79%	1.79%
Developed	12.3%	12.32%	6.1%	6.1%
Natural	75.8%	75.8%	90.53%	90.53%
Wetland	1.8%	1.79%	1.59%	1.59%
Impervious Cover	2.67%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Day Brook as a CFR and it is designated as Cold Water in the proposed SWQS. DFG biologists conducted backpack electrofishing in the brook upstream of Audubon Rd, Northampton in August 2010 (SampleID 3523). The sample was comprised entirely of fluvial specialist species including multiple age classes of Eastern brook trout and a few slimy sculpin.

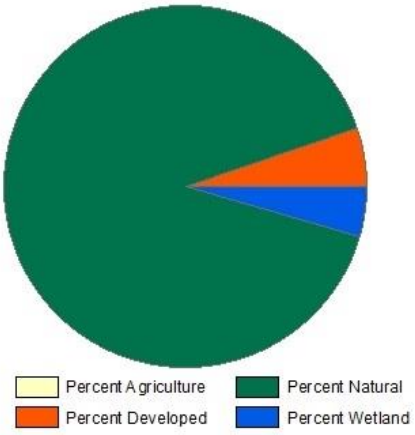
The Aquatic Life Use of Day Brook is assessed as Fully Supporting based on the fish sampling data (presence of multiple age classes of brook trout and slimy sculpin).

DEAN BROOK (MA34-50)

Location:	Headwaters, east of West Pelham Road (at mouth of Baker Brook), Shutesbury to mouth at confluence with Adams Brook (in small "diversion pool" for Atkins Reservoir), Shutesbury.
AU Type:	RIVER
AU Size:	2.4 MILES
Classification/Qualifier:	A: PWS, ORW, CWF (Tributary)

DEAN BROOK - MA34-50

Watershed Area: 3.90 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.90	3.89	1.25	1.25
Agriculture	1%	0.95%	0.32%	0.32%
Developed	5.2%	5.22%	3.86%	3.87%
Natural	89.5%	89.46%	88.75%	88.73%
Wetland	4.4%	4.37%	7.06%	7.08%
Impervious Cover	2.56%			

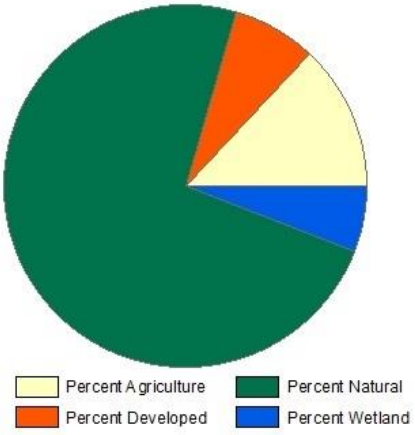
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG biologists conducted backpack electrofishing in Dean Brook downstream of Pratt Corner Rd, Shutesbury in August 2003 (SampleID 956). The sample was comprised entirely of multiple age classes of Eastern brook trout. The Aquatic Life Use of Dean Brook is assessed as Fully Supporting based on the fish data (presence of multiple age classes of brook trout).

DRY BROOK (MA34-64)

Location:	Headwaters, west of Huckle Hill Road, Bernardston to mouth at confluence with the Connecticut River, Gill.
AU Type:	RIVER
AU Size:	8.3 MILES
Classification/Qualifier:	B

DRY BROOK - MA34-64

Watershed Area: 9.38 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	9.38	5.88	2.06	1.57
Agriculture	12.9%	17.56%	16.64%	19.35%
Developed	7.6%	9.94%	7.17%	9.01%
Natural	73.6%	64.7%	60.91%	54.29%
Wetland	5.9%	7.8%	15.28%	17.34%
Impervious Cover	3.27%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)

MassDFG biologists conducted backpack electrofishing in Dry Brook at North Cross Rd, Gill in July 2006 (SampleID 1592) and further downstream off Grist Mill Rd @ Vassar Way, Gill in August 2005 (Sample ID 1144). Both samples were well represented with multiple age classes of Eastern brook trout and slimy sculpin as well as other fluvial species. MassDFG lists Dry Brook as a CFR and it is a designated Cold Water in the proposed SWQS. MassDEP staff conducted water quality monitoring further downstream at Main Rd, Gill (W1785) during the summer of 2008. Except for elevated temperature during the June deployment these data were indicative of good water quality as follows: minimum DO 7.51mg/L during the five-day unattended continuous probe deployments in May, June and July (mean minimums ranging from 7.75-8.46mg/L), maximum DO saturation 103.2%, max diel DO shift 1.36mg/L, maximum temperature 22.4°C. During the June deploy the 4 DADM was 21.4°C (above the Tier 1 Existing Use Cold Water guideline of 20.0°C) which warrants an alert. The pH ranged from 6.5-6.8SU and the seasonal average total phosphorus concentration was low (0.03mg/L, maximum 0.049mg/L).

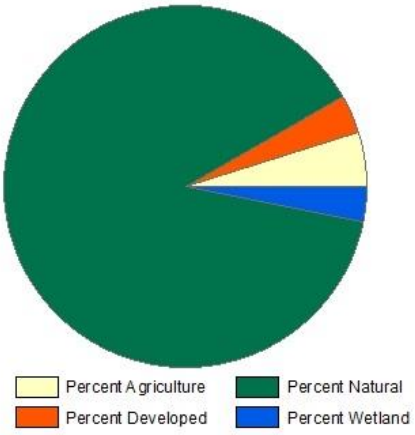
The Aquatic Life Use of Dry Brook is assessed as Fully Supporting based on the water quality and fish survey data. An alert is being identified because of elevated instream temperature during the June probe deployement in this Existing Use Tier 1 Cold Water so additional monitoring is being recommended.

East Branch Mill River (MA34-37)

Location:	Headwaters, confluence with Bradford Brook, Williamsburg to mouth at confluence with West Branch Mill River (forming headwaters Mill River), Williamsburg.
AU Type:	RIVER
AU Size:	2.8 MILES
Classification/Qualifier:	B: CWF

East Branch Mill River - MA34-37

Watershed Area: 9.52 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	9.52	3.31	2.30	0.90
Agriculture	4.9%	6.8%	3.3%	4.8%
Developed	3.4%	6.4%	4.1%	6.8%
Natural	88.6%	85.9%	87.1%	85.7%
Wetland	3.1%	0.9%	5.5%	2.8%
Impervious Cover	1.5%			

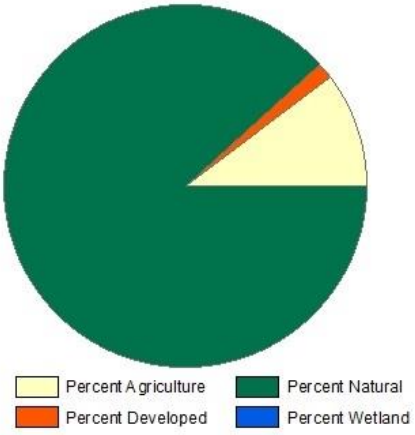
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG biologists conducted backpack electrofishing in the East Branch Mill River in August each year between 2006 and 2013 along Ashfield Rd, Williamsburg. The Sample IDs included: 2453, 4113, 2078, 3608, 3218, 4637, 2949, and 1837. These samples were all comprised of multiple age classes of Eastern brook trout as well as slimy sculpin. Brown trout, Atlantic salmon and other fluvial species were also present. The Aquatic Life Use of the East Branch Mill River is assessed as Fully Supporting based on the fish community data indicating the presence of cold water species.

ESTHER BROOK (MA34-78)

Location:	Headwaters, perennial portion, near Dickinson Hill Road crossing, Whately to mouth at confluence with Mill River, Whately.
AU Type:	RIVER
AU Size:	1.3 MILES
Classification/Qualifier:	B

ESTHER BROOK - MA34-78

Watershed Area: 0.90 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.90	0.90	0.24	0.24
Agriculture	10.2%	10.18%	20.58%	20.58%
Developed	1.4%	1.35%	2.68%	2.68%
Natural	87.6%	87.58%	74.51%	74.51%
Wetland	0.9%	0.89%	2.23%	2.23%
Impervious Cover	0.86%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Esther Brook as a CFR and it is a designated Cold Water in the proposed SWQS.MassDFG biologists conducted backpack electrofishing in Esther Brook upstream of the North Street crossing, Whately in July and August 2007 (SampleIDs 2405 & 2149). Both samples were comprised of multiple age classes of Eastern brook trout and the fluvial specialist blacknose dace.

The Aquatic Life Use of Esther Brook is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout.

Factory Hollow Pond (MA34021)

Location:	Amherst.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

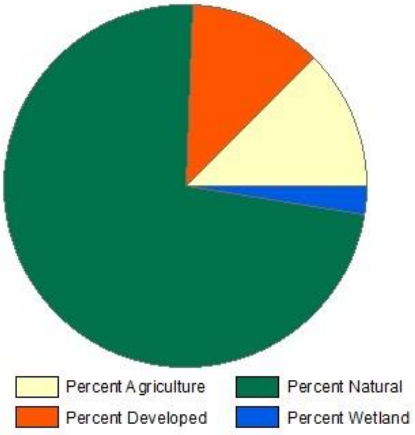
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No available data are available to assess the Aquatic Life Use of Factory Hollow Pond so it is Not Assessed.

Fall River (MA34-33)

Location:	Vermont/Massachusetts border, Bernardston to mouth at confluence with Connecticut River, Greenfield/Gill.
AU Type:	RIVER
AU Size:	10.2 MILES
Classification/Qualifier:	B: CWF

Fall River - MA34-33

Watershed Area: 34.18 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	22.52	4.84	5.18	1.26
Agriculture	12.4%	15.6%	16.6%	16.4%
Developed	12%	16.7%	12.8%	14.9%
Natural	73.1%	64.5%	64.8%	62.3%
Wetland	2.5%	3.2%	5.7%	6.5%
Impervious Cover	4%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing at sixteen times in August or September between 2004 and 2013. Two samples were collected in the upper section of the AU between the State line and Burke Flat Rd, Bernardston (SampleIDs 962 & 1343), six samples around/downstream of Burke Flat Rd, Bernardston (Sample IDs 1847, 4656, 2070, 2984, 2436 & 3174), seven samples further downstream around Bascom Rd bridge, Gill/Greenfield (Sample IDs 2085, 2435, 3175, 2983, 4657, 1846 & 963) and one sample very close to mouth approximately 370m upstream from the end of Factory Hollow Rd, Gill/Greenfield (Sample ID 4509). These samples were all comprised almost entirely of fluvial fishes including multiple age classes of Eastern brook trout, slimy sculpin, Atlantic salmon, brown trout and others. MassDEP biologists also collected a benthic macroinvertebrate sample (Sample ID B0638), ~370m upstream from the end of Factory Hollow Rd, Gill/Greenfield, in July 2008. The RBPIII status of the sample was “slightly impaired”, with 70% comparability to the Amethyst Brook reference station (B0514). Water quality monitoring (discrete sampling except for thermistor deployment) by MassDEP staff ~1000ft upstream of Factory Hollow Rd, Greenfield (W1782) during the summer of 2008, was indicative of good conditions except for temperature (minimum DO 9.7mg/L, maximum saturation 105%, pH 7.1 to 7.4SU, seasonal average total phosphorus concentration was low (0.009mg/L, maximum 0.018mg/L). There were no observations of dense or very dense filamentous algae noted either. The maximum temperature recorded during the long-term (63-day) thermistor deployment was 23.0°C with a maximum 7 DADM of 21.7°C (exceeding the chronic criterion for a cold water fishery 17 times), although the maximum daily mean was only 21.3°C (meeting the acute criterion). The general nature of the temperature excursions appeared to be as expected for a small stream in the summer months (i.e., temperatures were >20°C between mid-July and late August, with no isolated spikes. A dam at the mouth of Fall

Rive, the “International Paper Co. #2 Dam” (Gill/Greenfield), was removed at the end of 2014 and so the summer 2008 temperature data were not considered representative of current conditions and a temperature impairment decision was not made.
The Aquatic Life Use for Fall River is assessed as Fully Supporting based on the fish (dominated by fluvial species including multiple age classes of Eastern brook trout and slimy sculpin), as well as the benthic macroinvertebrate and limited water quality data collected during the summer of 2008.

Forge Pond (MA34024)

Location:	Granby.
AU Type:	FRESHWATER LAKE
AU Size:	72 ACRES
Classification/Qualifier:	B: WWF (impoundment on river designated B/WWF)

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
There is an infestation of the non-native aquatic macrophyte, *Trapa natans* (Water Chestnut), in Forge Pond. No other recent data are available for this reporting cycle. The Aquatic Life Use for Forge Pond will continue to be assessed as Not Supporting with the Nutrient/Eutrophication Biological Indicators impairment being carried forward. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	The impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

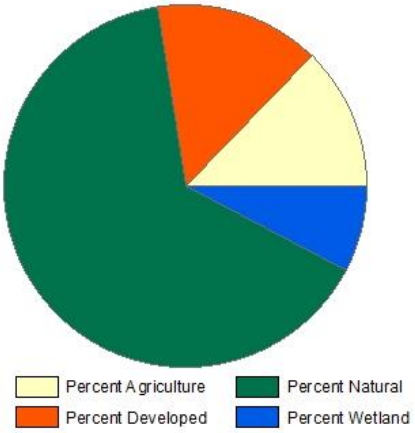
There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Forge Pond (MassDEP Undated). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Fort River (MA34-27)

Location:	Headwaters (confluence of Adams and Amethyst brooks, Amherst), to mouth at confluence Connecticut River, Hadley.
AU Type:	RIVER
AU Size:	12.8 MILES
Classification/Qualifier:	B

Fort River - MA34-27

Watershed Area: 54.77 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	54.76	9.11	14.72	3.32
Agriculture	12.7%	36.2%	15.2%	38.3%
Developed	14.7%	16.3%	9.3%	12.8%
Natural	64.8%	40.8%	60.8%	36.5%
Wetland	7.7%	6.7%	14.7%	12.3%
Impervious Cover	5.4%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)

MassDEP staff conducted water quality monitoring at two locations along the Fort River during the summer of 2008-- ~50 feet east of Rt. 116 bridge in Amherst (W1804) and further downstream at Rt.47 in Hadley (W1051). At the upstream site (W1804) the minimum discrete DO measured was 7.0mg/L, maximum saturation was 99%, maximum temperature was 21.5°C and pH ranged from 6.2-7.0SU (n=5) with a low seasonal average total phosphorus concentration (0.026 mg/L, maximum 0.036 mg/L). Further downstream (W1051) the minimum DO was 6.21mg/L during the five-day probe deployments in May, June and July, the maximum saturation was 93.7%, the maximum diel DO shift was 1.37mg/L, and the maximum temperature was 22.4°C. The discrete pH measurements ranged from 6.2-6.8SU (n=5) and the seasonal average total phosphorus concentration was 0.043 mg/L (maximum 0.07 mg/L). MassDEP staff noted the presence of "*Potamogeton*" during these surveys, but further species identification is needed to determine if it was a non-native aquatic macrophyte. USGS staff also conducted limited sampling for nutrients and chloride in the river at South Maple Street, Hadley in April and August 2005 finding low concentrations.

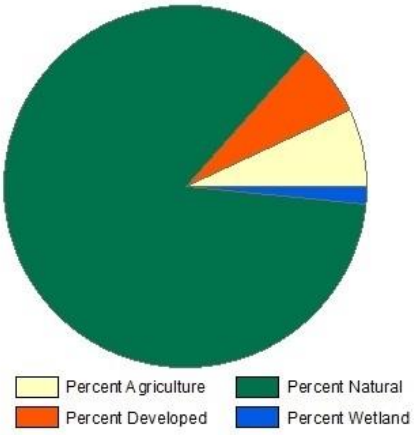
The Aquatic Life Use of Fort River is assessed as Fully Supporting based on water quality data collected by MassDEP and USGS staff during the summers of 2005 and 2008 all indicative of good water quality for Class B warm water. An Alert is being identified for a potential infestation of *Potamogeton crispus* and a recommendation is being made for further monitoring. The previous Alert for elevated total phosphorus will be removed since the seasonal averages during the summer of 2008 were <0.1mg/L (meeting EPA Gold Book criteria for flowing waters) at both locations sampled.

FOURMILE BROOK (MA34-56)

Location:	Headwaters, south of the intersection of Four Mile Brook Road and South Mountain Road, Northfield, to mouth at confluence with Connecticut River, Northfield.
AU Type:	RIVER
AU Size:	3.4 MILES
Classification/Qualifier:	B: CWF

FOURMILE BROOK - MA34-56

Watershed Area: 5.06 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	5.06	3.87	1.21	1.05
Agriculture	6.9%	5.04%	6.73%	5.11%
Developed	6.5%	6.43%	8.9%	9.53%
Natural	85.1%	87.36%	82.74%	84.07%
Wetland	1.5%	1.18%	1.63%	1.29%
Impervious Cover	2.11%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing at two locations in Fourmile Brook in August 2007 and August 2010. Both samples were collected along Fourmile Brook Rd, Northfield, about a half mile west of Rt. 63 (Sample IDs 2069 & 3193). These samples were both indicative of good water quality, with multiple age classes of Eastern brook trout, brown trout and Atlantic salmon. MassDEP staff also conducted water quality monitoring further downstream in the brook at Pine Meadow Rd, Northfield (W1803) during the summer of 2008. All of the discrete data were indicative of good water quality conditions for a cold water as follows: minimum DO 9.3mg/L, maximum saturation 102%, maximum temperature 16.9^{o}C, pH range 6.6 to 6.8SU, seasonal average total phosphorus very low (0.005mg/L, maximum 0.005mg/L). There were no observations of dense/very dense filamentous algae present.

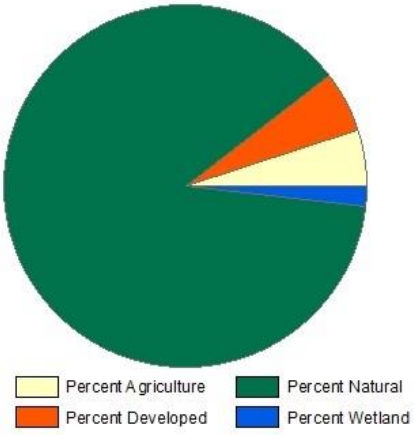
The Aquatic Life Use of Fourmile Brook is assessed as Fully Supporting based on the presence of multiple age classes of cold-water fish and the summer of 2008 water quality survey data.

GODDARD BROOK (MA34-84)

Location:	Headwaters east of Dry Hill Road, Montague to mouth at confluence with Sawmill River, Montague.
AU Type:	RIVER
AU Size:	2.9 MILES
Classification/Qualifier:	B

GODDARD BROOK - MA34-84

Watershed Area: 2.50 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.50	2.50	0.39	0.39
Agriculture	5%	4.98%	7.76%	7.76%
Developed	5.4%	5.37%	12.16%	12.16%
Natural	87.8%	87.81%	71.67%	71.67%
Wetland	1.8%	1.84%	8.41%	8.41%
Impervious Cover	2.34%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Goddard Brook as a CFR it is designated as Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing at two locations along Dry Hill Rd, Montague just upstream of the last Dry Hill Rd crossing in September 2006 (SampleID 1750) and just upstream of Rt.63 in August 2005 (SampleID 1290). Both samples were comprised entirely with multiple age classes of Eastern brook trout.

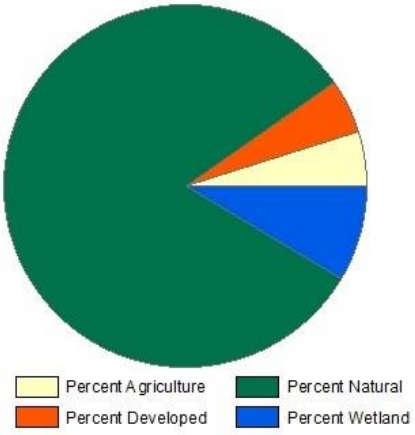
The Aquatic Life Use of Goddard Brook is assessed as Fully Supporting based on the presence of muliptle age classes of Eastern brook trout which is indicative of excellent habitat and water quality.

GRASS HILL BROOK (MA34-70)

Location:	Headwaters east of Grass Hill Road, Whately to mouth at confluence with Beaver Brook, Williamsburg.
AU Type:	RIVER
AU Size:	2.2 MILES
Classification/Qualifier:	B

GRASS HILL BROOK - MA34-70

Watershed Area: 2.00 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.00	2.00	0.39	0.39
Agriculture	4.8%	4.83%	12.27%	12.27%
Developed	4.8%	4.82%	2.92%	2.92%
Natural	81.8%	81.82%	63.37%	63.37%
Wetland	8.5%	8.53%	21.44%	21.44%
Impervious Cover	1.37%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Grass Hill Brook as a CFR and it is designated as Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Grass Hill Brook upstream of the Adams Rd crossing (just east of Mountain Street), Williamsburg in July 2007 (SampleID 2114). The sample was well represented by multiple age classes of Eastern brook trout, slimy sculpin, and other fluvial species.

The Aquatic Life Use of Grass Hill Brook is assessed as Fully Supporting based on the presence of cold water fish (multiple age classes of Eastern brook trout and slimy sculpin).

Green Pond (MA34028)

Location:	Montague.
AU Type:	FRESHWATER LAKE
AU Size:	15 ACRES
Classification/Qualifier:	A: PWS, ORW

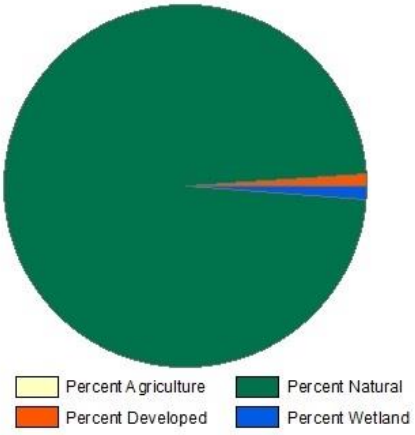
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Green Pond so it is Not Assessed.

HANNEGAN BROOK (MA34-83)

Location:	Headwaters southwest of Country Hill, Montague to mouth at inlet Lake Pleasant, Montague.
AU Type:	RIVER
AU Size:	1.7 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

HANNEGAN BROOK - MA34-83

Watershed Area: 1.36 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.36	1.36	0.20	0.20
Agriculture	0%	0%	0%	0%
Developed	1.1%	1.09%	3.68%	3.68%
Natural	97.7%	97.73%	95.88%	95.88%
Wetland	1.2%	1.17%	0.43%	0.43%
Impervious Cover	0.91%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Hannegan Brook as a CFR and it is designated as Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Hannegan Brook off Rt.63 Montague in August 2008 (SampleID 2734). The sample was comprised entirely of multiple age classes of Eastern brook trout.

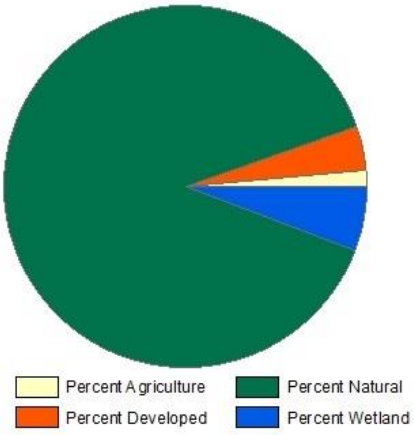
The Aquatic Life Use of Hannegan Brook is assessed as Fully Supporting based on the presence of cold-water fish (multiple age classes of Eastern brook trout).

HARRIS BROOK (MA34-48)

Location:	Headwaters, northeast of Enfield Road, Pelham to Intake Reservoir Dam (NATID: MA01270) outlet, Pelham (excluding approximately 0.2 miles through Hawley Reservoir, Pelham).
AU Type:	RIVER
AU Size:	1.2 MILES
Classification/Qualifier:	A: PWS, ORW, CWF (PWS and Tributary to PSW)

HARRIS BROOK - MA34-48

Watershed Area: 6.21 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	6.21	6.00	2.17	2.04
Agriculture	1.4%	1.45%	1.61%	1.63%
Developed	4%	4.14%	2.55%	2.68%
Natural	88.8%	88.63%	85.07%	84.58%
Wetland	5.7%	5.78%	10.77%	11.11%
Impervious Cover	1.83%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)

MassDFG biologists conducted backpack electrofishing at three locations along this Harris Brook AU (MA34-48) in Pelham. The most upstream sample was collected off Amherst Rd, downstream of Hawley Reservoir in August 2008 (Sample ID 2753). This sample was dominated by white sucker (a tolerant fluvial dependant species) and the only other species present was the tolerant macrohabitat generalist golden shiner. Further downstream at Meetinghouse Rd crossing multiple age classes of Eastern brook trout were the dominant species in the samples collected in September 2008 and August 2003 (Sample ID's 2594 and 952, respectively).

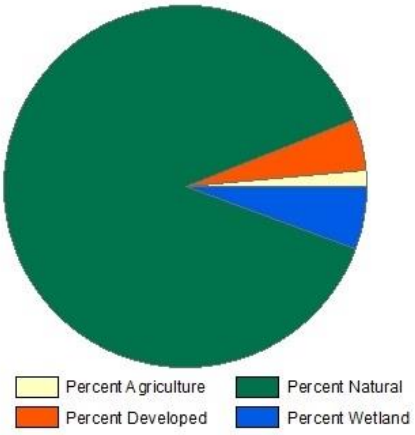
The Aquatic Life Use of this Harris Brook AU (MA34-49) is assessed as Fully Supporting based on the presence of cold-water fish (multiple age classes of Eastern brook trout) in the samples collected near Meetinghouse Road in Pelham. The influence of Hawley Reservoir, however, is noted with an alert, as no cold water fish were documented in the brook below this Reservoir.

HARRIS BROOK (MA34-94)

Location:	From outlet of Intake Reservoir Dam (NATID: MA01270), Pelham to mouth at confluence with Buffum Brook (forming headwaters Amethyst Brook), Pelham.
AU Type:	RIVER
AU Size:	0.3 MILES
Classification/Qualifier:	B: CWF

HARRIS BROOK - MA34-94

Watershed Area: 6.41 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	6.41	6.00	2.22	1.99
Agriculture	1.4%	1.49%	1.57%	1.67%
Developed	4.6%	4.88%	2.57%	2.81%
Natural	88.4%	88.11%	85.31%	84.48%
Wetland	5.6%	5.52%	10.55%	11.04%
Impervious Cover	1.95%			

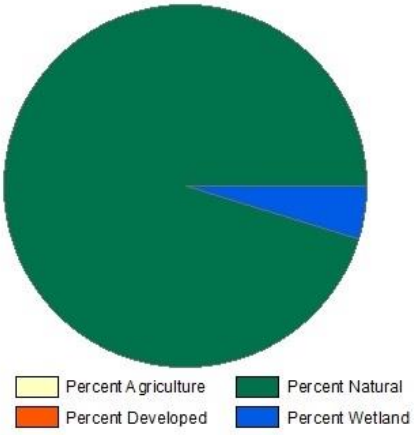
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG biologists conducted backpack electrofishing in this Harris Brook AU (MA34-94) downstream of the out-take reservoir dam, west of Meetinghouse Rd, Pelham in September 2008 (Sample ID 2596). The sample was comprised entirely of fluvial fishes and contained multiple age classes of Eastern brook trout. The Aquatic Life Use of this Harris Brook AU (MA34-94) is assessed as Fully Supporting based on the presence of cold-water fish (multiple age classes of Eastern brook trout).

HEARTHSTONE BROOK (MA34-76)

Location:	Headwaters, perennial portion, south of Poverty Mountain, Pelham to mouth at confluence with Adams Brook, Amherst.
AU Type:	RIVER
AU Size:	2.3 MILES
Classification/Qualifier:	B

HEARTHSTONE BROOK - MA34-76

Watershed Area: 1.35 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.35	1.35	0.47	0.47
Agriculture	0.2%	0.22%	0.46%	0.46%
Developed	0.7%	0.67%	0.53%	0.53%
Natural	94.5%	94.46%	88.61%	88.61%
Wetland	4.7%	4.65%	10.39%	10.39%
Impervious Cover	0.14%			

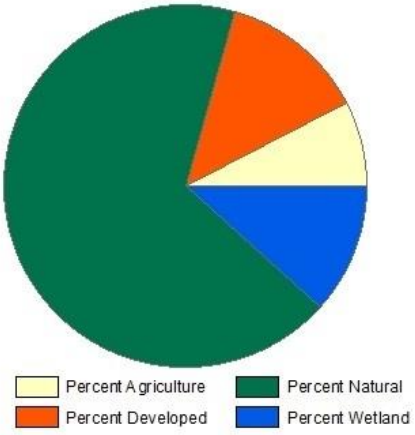
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG lists Hearthstone Brook as a CFR and it is designated as Cold Water in the proposd SWQS. MassDFG biologists conducted backpack electrofishing in Hearthstone Brook at the second road crossing behind Wagner Farm, Amherst in August 2013 (SampleID 4989). The sample was dominated by multiple age classes of Eastern brook trout. The Aquatic Life Use of Hearthstone Brook is assessed as Fully Supporting based on the presence of cold-water fish (multiple age classes of Eastern brook trout).

HOP BROOK (MA34-61)

Location:	Headwaters, west of Oasis Drive, Belchertown to mouth at confluence with Fort River, Amherst.
AU Type:	RIVER
AU Size:	8.6 MILES
Classification/Qualifier:	B

HOP BROOK - MA34-61

Watershed Area: 16.83 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	16.83	8.13	2.98	1.55
Agriculture	7.5%	11.71%	8.86%	14.26%
Developed	13.1%	17.46%	7.23%	5.91%
Natural	67.8%	51.97%	56.44%	40%
Wetland	11.6%	18.86%	27.48%	39.83%
Impervious Cover	4.61%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)

There are two distinct reaches along this Hop Brook AU, the upper reach high gradient and the lower low gradient reach. Backpack electrofishing was conducted in Hop Brook by MassDFG biologists downstream from Federal Street crossing in Belchertown (Sample ID 764) in August 2002. This sample was dominated by multiple ages of eastern brook trout and slimy sculpin. Further downstream MassDEP staff conducted discrete water quality sampling in the low gradient portion of the brook at Station Road, in Amherst (W1800) during the summer of 2008. DO here ranged from 4.1 to 8.7mg/L (2 of 5 measurements below 5.0mg/L, 3 of 5 below 6.0mg/L), the maximum saturation was 85%, maximum temperature 22.6°C (2 of 5 measurements above 20°C), pH ranged from 5.9 to 6.6SU (n= 5) and the seasonal average total phosphorus concentration was low (0.033mg/L, maximum 0.04mg/L). There were no observations of dense/very dense filamentous algae. It should also be noted that a very large area of Hop Brook, primarily in the low gradient portion, lies within a MassDEP Zone II wellhead protection area.

The Aquatic Life Use of Hop Brook is assessed as having Insufficient Information. While the presence of multiple age classes of Eastern brook trout in the high gradient upper reach were indicative of excellent habitat and water quality conditions this sample was dated. DO was occasionally low and temperature occasionally above 20°C in the low gradient reach during the summer of 2008 but no indications of nutrient enrichment problems were identified. DO and temperature are being identified as Alert issues and the influence of groundwater withdrawals may exacerbate these stresses.

Ingraham Brook Pond (MA34037)

Location:	Granby.
AU Type:	FRESHWATER LAKE
AU Size:	5 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Non-Native Aquatic Plants*)		Removed
4c	4c	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
An infestation of *Trapa natans* (Water Chestnut) was observed in Ingraham Brook Pond by Silvio O. Conte National Fish and Wildlife Refuge staff. No other recent data are available for this reporting cycle. The Aquatic Life Use for Ingraham Brook Pond will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophytes "Water Chestnut"

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

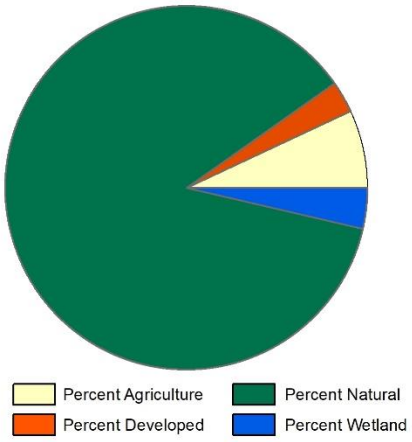
There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Ingraham Brook Pond (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophytes "Water Chestnut".

JOE WRIGHT BROOK (MA34-52)

Location:	Headwaters south of Hemenway Trail, Williamsburg to mouth at confluence with Mill River, Williamsburg.
AU Type:	RIVER
AU Size:	3.3 MILES
Classification/Qualifier:	B: CWF

JOE WRIGHT BROOK - MA34-52

Watershed Area: 3.43 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.43	3.43	1.04	1.04
Agriculture	6.97%	6.97%	6.77%	6.7%
Developed	2.81%	2.81%	3.48%	3.48%
Natural	86.73%	86.73%	81.43%	81.4%
Wetland	3.62%	3.62%	8.58%	8.5%
Impervious Cover	0.01%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing just upstream of the Depot Rd bridge in Williamsburgh in August 2004 and August 2008 (Sample IDs 2744 & 1068). Both samples contained multiple age classes of Eastern brook trout and slimy sculpin as well as other fluvial species.

The Aquatic Life Use for Joe Wright Brook is assessed as Fully Supporting based on the presence of cold-water fish (multiple age classes of Eastern brook trout and slimy sculpin).

Lake Bray (MA34013)

Location:	Holyoke.
AU Type:	FRESHWATER LAKE
AU Size:	10 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Curly-leaf Pondweed*)		Added
4c	4c	(Non-Native Aquatic Plants*)		Removed
4c	4c	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

The MassDEP 1998 synoptic survey identified infestations of the non-native aquatic macrophyte *Potamogeton crispus* (Curly-leaf pondweed) in Lake Bray. A second non-native aquatic macrophpyte species in the Lake, *Trapa natans* (Water Chestnut). was reported by Silvio O. Conte National Fish and Wildlife Refuge staff.
The Aquatic Life Use of Lake Bray will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophytes Water Chestnut and Curly-leaf pondweed are being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic “Non-Native Aquatic Plants” to the specific macrophytes “Water Chestnut” and “Curly-leaf pondweed”

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

There are infestations of the non-native aquatic macrophytes, *Potamogeton crispus* (MassDEP 1998) and *Trapa natans* (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007), in Lake Bray. The impairment was changed from the generic “Non-Native Aquatic Plants” to the specific macrophytes “Water Chestnut” and “Curly-leaf pondweed”.

Lake Holland (MA34035)

Location:	Belchertown.
AU Type:	FRESHWATER LAKE
AU Size:	11 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Fanwort*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

During the MassDEP 1998 synoptic survey infestations of the non-native aquatic macrophytes, *Myriophyllum heterophyllum* (Variable-leaf milfoil) and *Cabomba caroliniana* (Fanwort), were noted as being present in Lake Holland. No other more recent data are available.

The Aquatic Life Use of Lake Holland will continue to be assessed as Not Supporting due to the presence of Non-Native Aquatic Plants and the Fanwort impairment is being added.

Lake Lookout (MA34044)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	7 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Lake Lookout so it is Not Assessed.

Lake Pleasant (MA34070)

Location:	Montague.
AU Type:	FRESHWATER LAKE
AU Size:	54 ACRES
Classification/Qualifier:	A: PWS, ORW

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Lake Pleasant so it is Not Assessed.

Lake Warner (MA34098)

Location:	Hadley.
AU Type:	FRESHWATER LAKE
AU Size:	65 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4a	4a	(Fanwort*)		Added
4a	4a	(Non-Native Aquatic Plants*)		Removed
4a	4a	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
Infestations of the non-native aquatic macrophytes, *Trapa natans* (Water Chestnut) and *Cabomba caroliniana* (Fanwort) were identified in Lake Warner. No other more recent data are available. The Aquatic Life Use of Lake Warner will continue to be assessed as Not Supporting with the algae, dissolved oxygen, total phosphorus and turbidity impairments being carried forward. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophytes Water Chestnut and Fanwort impairments are being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic “Non-Native Aquatic Plants” to the specific macrophytes “Water Chestnut” and “Fanwort”.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

There are infestations of the non-native aquatic macrophytes, *Trapa natans* (Boettner 2007) and *Cabomba caroliniana* (MassDEP Undated), in Lake Warner. The impairment was changed from the generic “Non-Native Aquatic Plants” to the specific macrophytes “Water Chestnut” and “Fanwort”.

Lake Wyola (MA34103)

Location:	Shutesbury.
AU Type:	FRESHWATER LAKE
AU Size:	124 ACRES
Classification/Qualifier:	B

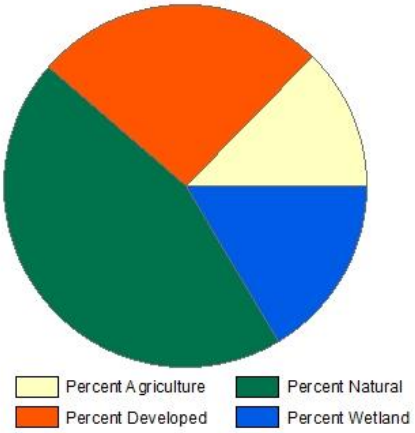
Fish, other Aquatic Life and Wildlife Use: Not Supporting
There are no new water quality data available for Lake Wyola so the Aquatic Life Use will continue to be assessed as Not Supporting with the Nutrient/Eutrophication Biological Indicators and Total Phosphorus impairments being carried forward. A TMDL for this Lake was completed and approved by EPA in April 2002.

Lampson Brook (MA34-06)

Location:	Belchertown WWTP discharge, Belchertown to mouth at confluence with Weston Brook, Belchertown.
AU Type:	RIVER
AU Size:	1 MILE
Classification/Qualifier:	B: WWF

Lampson Brook - MA34-06

Watershed Area: 1.90 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.89	1.89	0.54	0.54
Agriculture	12.6%	12.6%	13.6%	13.6%
Developed	26%	26%	14.3%	14.3%
Natural	44.9%	44.9%	39.8%	39.8%
Wetland	16.4%	16.4%	32.3%	32.3%
Impervious Cover	8.9%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Benthic Macroinvertebrates		Added
5	5	Dissolved Oxygen		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting

The Town of Belchertown Water Reclamation Facility is permitted (MA0102148) to discharge treated wastewater to Lampson Brook. Between November 2007 and August 2018, 37 valid whole effluent toxicity tests were conducted on facility's effluent using *C. dubia*. The LC_{50}s were all ≥100% effluent. Of the 35 tests with valid CNOEC data, most ranged from 94-100% effluent, except for the August 2017 test (CNOEC = 50% effluent). MassDEP biologists collected a benthic macroinvertebrate sample from Lamposon Brook at the George Hannum Road crossing roughly 200 feet downstream of the Belchertown WRF (B0636) in July 2008. The RBPIII analysis of the sample indicated moderately impaired conditions (40% comparable) against the Amethyst Brook reference site (B0514). Water quality monitoring in this reach of Lampson Brook (W1055) was also conducted in the summer of 2008. The minimum DO measured during the five-day probe deployments in May, June and July plus a two day deploy in September was 6.11mg/L, with a maximum DO saturation of 99.7%, and a maximum diel DO shift of 1.78mg/L. The maximum temperature was 22.2°C. Discrete pH measurements ranged from 7.2 to 7.6SU (n=7), and the seasonal average total phosphorus concentration (n=5) was 0.085 mg/L (maximum 0.16mg/L in June).
The Aquatic Life Use of Lampson Brook is assessed as Not Supporting with the total phosphorus impairment being carried forward and a new impairment for Benthic Macroinvertebrates being added. Since all the continuous DO

data (minimum DO 6.11mg/L measured during the summer of 2008) were well above the 5.0mg/L criterion for a Class B, warm water, the Dissolved Oxygen impairment is be delisted (See Removal Comment for additional information).

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Dissolved Oxygen	Applicable WQS attained, due to restoration activities	Lampson Brook was first listed as impaired for Organic enrichment/Low DO in 1992 (this impairment code was converted to "Oxygen, Dissolved" in 2008). The DO impairment was based on low DO (<3 mg/L) collected in the brook during the 1988 instream chlorine toxicity study of the Belchertown Water Reclamation Facility (MA0102148). At the time of this study, the Belchertown WRF achieved secondary treatment and had a design flow of 0.5MGD. In 2000, the facility was upgraded to achieve advanced treatment with a design flow of 1.0MGD. The facility comprises ~94% of the brook at 7Q10 so has a large influence on water quality conditions. The permittee was issued an administrative compliance order (AO) on July 19, 2004 by EPA to address phosphorus limit exceedances among other violations of the NPDES individual permit. All of the Order's requirements were met by the Town. The June 9, 2005 permit required the discharge to meet a minimum DO of 6.0mg/L and allowed an average monthly TP limit of 0.25 mg/L and an average monthly flow of 1.0 MGD. The most recent (July 31, 2014) NPDES permit required a further reduction of the TP limit to a seasonal average (April 1 – October 31) of 0.11 mg/L. This permit also requires the discharge to meet a minimum DO of 6.0mg/L. During the summer 2008 (before the more stringent 0.11 mg/L seasonal TP limit took effect), MassDEP staff conducted a water quality survey in Lampson Brook at site W1055 (~700 ft downstream of the Belchertown WRF discharge). Dissolved oxygen was measured over three 5-day deployments and one 2-day deployment. These data were all indicative of good water quality (minimum DO 6.11mg/L). Satellite images of the Lampson Brook watershed indicate that land use patterns remained similar between 2005 and 2015 (with some minor development). Therefore, data collected within this timeframe are considered usable for water quality assessment, listing, and delisting decisions. Given upgrades to the Belchertown Water Reclamation Facility and the summer 2008 MassDEP dissolved oxygen data indicating all measurements above the water quality standard of 5.0mg/L, the impairment for "Oxygen, Dissolved" is being removed.

Supporting Information for Delisted Impairments

Dissolved Oxygen

2008 Multiprobe Data of MassDEP Site W1055 Lampson Brook [George Hannum Street, approximately 50 feet downstream of Belchertown WWTP (MA0102148) discharge, Belchertown] (MassDEP Undated)

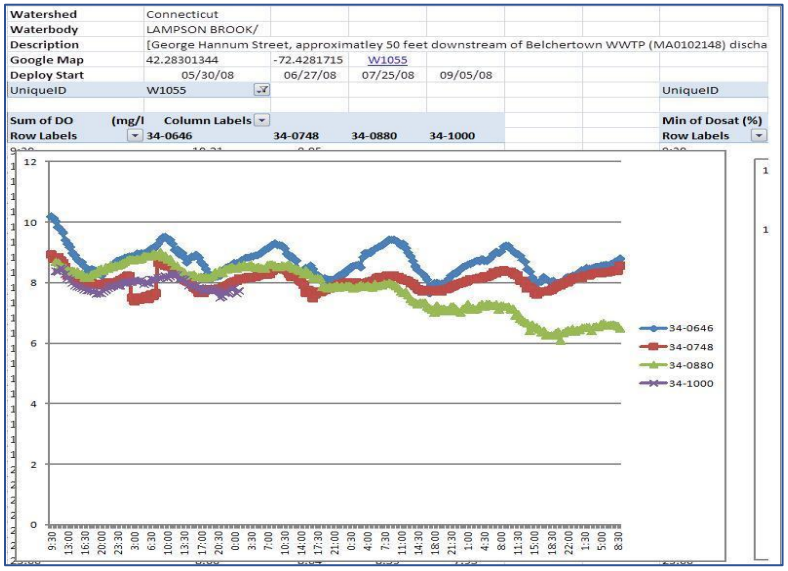
Unique ID	Gear Type	Project Name	OWMIDs Used to Build File	
W1055	Data Sonde	Connecticut (2008)	34-0646, 34-0748, 34-0880, 34-1000	
Station ID	**Station Description**	**Mile Point**	**Latitude (dec-degrees)**	**Longitude (dec-degrees)**
LAMP1	[George Hannum Street, approximatley 50 feet downstream of Belchertown WWTP (MA0102148) discharge, Belchertown]	0.907	42.28301344	-72.42817152
Watershed	**SARIS_PALIS_CAMIS**	**Water Body**		
Connecticut	3418125	LAMPSON BROOK		
Station File Start Time	5/30/2008 9:30 AM			
Station File End Time	9/10/2008 9:00 AM			
Total Station File Duration (Hours)	2471.5			
Total Station File Count	4944			
	Analytes			
	Temperature (Celsius)	**DO (mg/L)**	**DOsat (%)**	
Observed Deployment Time (Hours)	476.0	396.0	396.0	
Observed Count	956	796	796	
Avg*	18.4	8.2	88	
SD*	2.0	0.6	6	
Min*	12.9	6.1	68	
Max*	22.2	10.2	100	
Median*	18.5	8.2	89	
IQR*	2.5	0.7	6	
Mean of the Daily Mean*	18.4	8.2	[redacted]	
Mean of the Daily Min*	16.7	7.6		
Mean of the Daily Max*	20.2	8.7		
MWAT*	--	[redacted]		
Amount of Time > 20 deg. C (Hours)	110.6			
Max Duration > 20 deg. C (Hours)	16.2			
Avg Daily Amount of Time > 20 deg. C (Hou	5.3			
Amount of Time > 28.3 deg. C (Hours)	0.0			
Max Duration > 28.3 deg. C (Hours)	0.0			
Avg Daily Amount of Time > 28.3 deg. C (H	0.0			
Amount of Time > 29.4 deg. C (Hours)	0.0			
Max Duration > 29.4 deg. C (Hours)	0.0			
Avg Daily Amount of Time > 29.4 deg. C (H	0.0			
Amount of Time < 3.0 mg/L (Hours)	[redacted]	0.0		
Max Duration < 3.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 3.0 mg/L (Hour		0.0		
Amount of Time < 4.0 mg/L (Hours)		0.0		
Max Duration < 4.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 4.0 mg/L (Hour		0.0		
Amount of Time < 5.0 mg/L (Hours)		0.0		
Max Duration < 5.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 5.0 mg/L (Hour		0.0		
Amount of Time < 6.0 mg/L (Hours)		0.0		
Max Duration < 6.0 mg/L (Hours)		0.0		
Avg Daily Amount of Time < 6.0 mg/L (Hour		0.0		
**Units are those of the analyte listed. SD is unitless.*				

DO probe data (MassDEP Undated)

UniqueID	Waterbody	AU_Class	AU_ClassQu	Start.Date	Days	OWMID.Minimum.DO	Daily.Mean.Minimum.DO	Maximum.Daily.DO.Shift	OWMID.Mean.DO	OWMID.Maximum.Saturation	Violates.Criteria
W1055	LAMPSON BROOK	B	WWF	05/30/08	5	7.67	8.01	1.78	8.71	99.7	None
W1055	LAMPSON BROOK	B	WWF	06/27/08	5	7.41	7.69	1.27	8.08	94.3	None
W1055	LAMPSON BROOK	B	WWF	07/25/08	5	6.11	7.11	1.21	7.80	96.3	None
W1055	LAMPSON	B	WWF	09/05/08	2	7.53	7.60	0.76	7.96	95.2	None

	BROOK										

DO probe deployment graph



Discrete dissolved oxygen readings Site W1055 Lampson Brook [George Hannum Street, approximately 50 feet downstream of Belchertown WWTP (MA0102148) discharge, Belchertown] were obtained on 8 occasions with 0 recordings < 4mg/L (MassDEP Undated) (MassDEP Undated):

attended data

Waterbody	UNIQUE_ID	DESCRIPTOR	DATE	TIME	FLOWSTAT	DEPTH	TEMP	PH	PHSS	SPCOND	SPCONDSS	DO	DOSS	DOSAT	ResComm
Lampson Brook	W1055	[George Hannu	5/30/2008	9:20:00 AM	Flowing	0.2	13.3	7.3		418		10.4		101	
Lampson Brook	W1055	[George Hannu	6/4/2008	9:23:02 AM	Flowing	0.1	14.8	7.4	i	413	i	9.5		95	
Lampson Brook	W1055	[George Hannu	6/27/2008	9:00:33 AM	Flowing	0.2	15.8	7.4		330		9.3		96	
Lampson Brook	W1055	[George Hannu	7/2/2008	9:23:32 AM	Flowing	0.1	18.2	7.6		416	u	9.0		97	
Lampson Brook	W1055	[George Hannu	7/25/2008	10:05:01 AM	Flowing	0.4	19.1	7.2		281		8.5		93	
Lampson Brook	W1055	[George Hannu	7/30/2008	9:12:31 AM	Flowing	--	17.9	7.4		375	u	8.7		93	
Lampson Brook	W1055	[George Hannu	9/5/2008	10:02:42 AM	Flowing	--	18.3	7.6		398		8.8		95	
Lampson Brook	W1055	[George Hannu	9/10/2008	9:04:29 AM	Flowing	--	15.8	--		--		9.3		94	

According to the July 31, 2014 NPDES Individual Permit for the Belchertown WRF:
"*The permittee was issued an administrative compliance order (AO) on July 19, 2004 by EPA to address phosphorus permit limitation exceedances among other violations of the permit…. All of the Order's requirements have been met by the Town. In summary, the Town's report, prepared by Tighe & Bond Consulting Engineers and dated October 12, 2004, concluded that most of the exceedances were directly related to three separate unrelated instances of mechanical failure that have each been resolved. Some of the additional conditions that were potentially linked to somewhat higher final effluent phosphorus concentrations included: septage deliveries, mixed liquor dissolved oxygen, sludge decant volumes, and sludge processing. Recommendations for corrective measures were included in the report, as well as an implementation schedule.*"

Leaping Well Reservoir (MA34040)

Location:	South Hadley.
AU Type:	FRESHWATER LAKE
AU Size:	9 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Leaping Well Reservoir so it is Not Assessed.

Leverett Pond (MA34042)

Location:	Leverett.
AU Type:	FRESHWATER LAKE
AU Size:	91 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The MassDEP 1998 synoptic survey recorded infestations of the non-native aquatic macrophytes, *Myriophyllum spicatum* and *Najas minor*, in Leverett Pond. No other more recent data are available. The Aquatic Life Use of Leverett Pond will continue to be assessed as Not Supporting with the Eurasian water milfoil and non-natiave aquatic plant impairments being carried forward.

Log Pond Cove (MA34124)

Location:	Holyoke (cove of Connecticut River upstream of Holyoke Dam (NATID: MA00973)).
AU Type:	FRESHWATER LAKE
AU Size:	19 ACRES
Classification/Qualifier:	B: WWF, CSO (cove on river designated B/WWF/CSO)

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
An infestation of *Trapa natans* (Water Chestnut) was observed in Log Pond Cove by Silvio O. Conte National Fish and Wildlife Refuge staff. No other more recent data are available. The Aquatic Life Use of Log Pond Cove will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.
Primary Contact Recreation Use: Not Supporting
An infestation of Trapa natans (Water Chestnut) was observed in Log Pond Cove by Silvio O. Conte National Fish and Wildlife Refuge staff. No other more recent data are available. The Primary Recreational Use of Log Pond Cove will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.
Secondary Contact Recreation Use: Not Supporting
An infestation of Trapa natans (Water Chestnut) was observed in Log Pond Cove by Silvio O. Conte National Fish and Wildlife Refuge staff. No other more recent data are available. The Secondary Recreational Use of Log Pond Cove will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.
Aesthetic Use: Not Supporting
An infestation of Trapa natans (Water Chestnut) was observed in Log Pond Cove by Silvio O. Conte National Fish and Wildlife Refuge staff. No other more recent data are available. The Aesthetic Use of Log Pond Cove will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

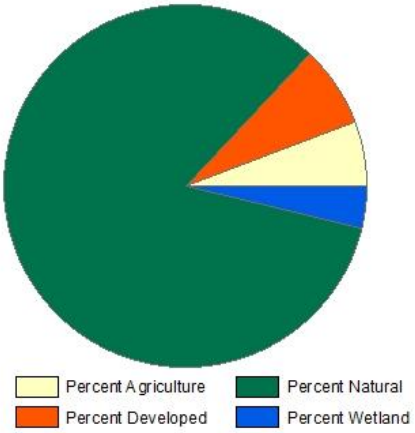
There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Log Pond Cove (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic “Non-Native Aquatic Plants” to the specific macrophyte “Water Chestnut”.

Long Plain Brook (MA34-09)

Location:	Headwaters, Leveret/Sunderland town line (in Mt. Toby State Forest) to mouth at confluence with Russellville Brook at Route 116, Sunderland.
AU Type:	RIVER
AU Size:	5 MILES
Classification/Qualifier:	B

Long Plain Brook - MA34-09

Watershed Area: 4.93 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.93	3.60	1.26	0.93
Agriculture	5.7%	7.8%	6.9%	9.3%
Developed	7.3%	8.5%	8.8%	8.1%
Natural	83.2%	79.2%	75.6%	71.6%
Wetland	3.7%	4.4%	8.8%	11.1%
Impervious Cover	3.5%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information (Alert)

MassDFG biologists conducted backpack electrofishing in Long Plain Brook in September 2013 at a private drive off Rt.63 opposite Depot Street, Leverett (SampleID 4698) and a little further downstream at the Bull Hill Rd crossing, Leverett (Sample ID 4699). Both samples in the low gradient habitat had few numbers of fish and were dominated by moderately tolerant macrohabitat generalist species, the most numerous being chain pickerel although three Eastern brook trout, including one below stocking size, were also collected at the downstream site. MassDEP staff also conducted very limited water quality monitoring near the mouth of the brook at Rt.116, Sunderland (W1801) in May and June 2008 since the brook was dry at this location for the rest of the summer which is of concern. Results of the discrete sampling can be summarized as follows: minimum DO 10.8mg/L, maximum saturation 99%, highest temperature 9.7°C, pH 6.6 and 6.9SU, average total phosphorus 0.005mg/L (maximum 0.005mg/L).

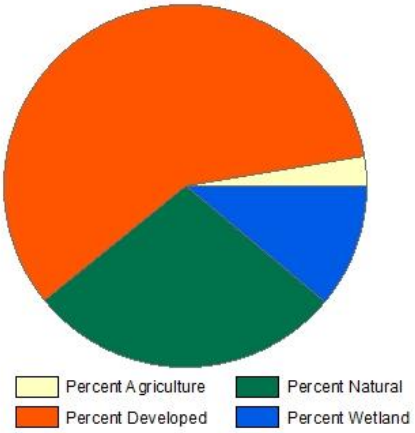
Too limited data are available to assess the Aquatic Life Use of Long Plain Brook. Although moderately tolerant macrohabitat generalist fish were present in the two samples collected from low gradient habitat in the brook in August 2013, three Eastern brook trout, including one below stocking size were also present, however the stream was dry near its mouth for the majority of the summer 2008. An alert is being identified for lack of flow in Long Plain Brook. Whether or not groundwater withdrawals are impacting flow in the brook needs further investigation.

Longmeadow Brook (MA34-21)

Location:	Headwaters, outlet Turner Park Pond, Longmeadow to mouth at confluence with Connecticut River, Longmeadow.
AU Type:	RIVER
AU Size:	4.5 MILES
Classification/Qualifier:	B

Longmeadow Brook - MA34-21

Watershed Area: 5.03 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.96	3.84	0.88	0.80
Agriculture	2.6%	3.4%	0.3%	0.3%
Developed	58.3%	57.3%	29.8%	28.7%
Natural	28.1%	26%	45.9%	45%
Wetland	11%	13.3%	24%	26%
Impervious Cover	17.3%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Trash		Changed

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)

MassDEP staff conducted water quality monitoring in Longmeadow Brook at the "slip of road" west at the Route 5 crossing, Longmeadow (W1794), during the summer of 2008. Continuous DO and temperature data were collected during five-day unattended probe deployments in May, June, July and September. The minimum DO was 4.97mg/L in June (a little low but still met criteria for a warmwater fishery as mean minimum DO ranged between 5.51 and 7.0mg/L during the four deploys). The maximum DO saturation was 105.9%, the maximum diel DO shift was 3.05mg/L (slightly above the 3.0mg/L threshold only in May), and the maximum temperature was 25.8°C (meeting warm water standards). Discrete pH measurements ranged from 6.7 to 7.1SU (n=8) and the seasonal average total phosphorus concentration (n=4 excluding the extremely high measurement of 0.44mg/L on September 9th two days after ~5"of rain on the 7th was recorded at the Amherst rain station since it is considered atypical of normal conditions) was 0.063mg/L (maximum of 0.1mg/L on July 1st was two days after one inch of rain). There were no observations of dense or very dense filamentous algae present and there was no other evidence of nutrient enrichment issues except for the slightly elevated diel DO shift in May.

The Aquatic Life Use of Longmeadow Brook is assessed as Fully Supporting based on the water quality data collected during the summer of 2008 that were indicative of generally good conditions. An Alert is being identified for elevated total phosphorus concentrations which most likely result from stormwater runoff.

Loon Pond (MA34045)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	26 ACRES
Classification/Qualifier:	B

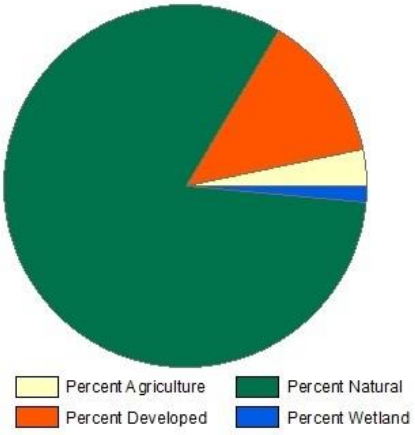
Fish, other Aquatic Life and Wildlife Use: Insufficient Information
No data are available to assess the Aquatic Life Use of Loon Pond so it is Not Assessed.

LOUISIANA BROOK (MA34-91)

Location:	From outlet dam (NATID: MA00051) of Louisiana Brook Reservoir, Northfield to mouth at confluence with Pauchaug Brook, Northfield.
AU Type:	RIVER
AU Size:	1.5 MILES
Classification/Qualifier:	B

LOUISIANA BROOK - MA34-91

Watershed Area: 1.43 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.43	1.43	0.22	0.22
Agriculture	3.3%	3.31%	3.42%	3.42%
Developed	13.1%	13.13%	12.42%	12.42%
Natural	82.2%	82.2%	80.22%	80.22%
Wetland	1.4%	1.36%	3.94%	3.94%
Impervious Cover	3.39%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG does list Louisiana Brook as a CFR and while it is currently not a designated Cold-Water stream in the SWQS, it needs to be protected as a Tier 1 Cold Water. MassDFG biologists conducted backpack electrofishing in Louisiana Brook at the Rt.10/Rt.63 crossing in August 2005 (SampleID 1291). The sample was comprised of multiple age classes of Eastern brook trout and slimy sculpin. The Aquatic Life Use of Louisiana Brook is assessed as Fully Supporting based on the presence of cold-water fish (multiple age classes of Eastern brook trout and slimy sculpin).

Lower Highland Lake (MA34047)

Location:	Goshen.
AU Type:	FRESHWATER LAKE
AU Size:	91 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Lower Highland Lake so it is Not Assessed.

Lower Mill Pond (MA34048)

Location:	Easthampton.
AU Type:	FRESHWATER LAKE
AU Size:	30 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Non-Native Aquatic Plants*)		Removed
4c	4c	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
An infestation of *Trapa natans* (Water Chestnut) was observed in Lower Mill Pond by Silvio O. Conte National Fish and Wildlife Refuge staff. No other more recent data are available. The Aquatic Life Use of Lower Mill Pond will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Lower Mill Pond (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Lower Van Horn Park Pond (MA34129)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	11 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Non-Native Aquatic Plants*)		Removed
4c	4c	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
An infestation of *Trapa natans* (Water Chestnut) was observed in Lower Van Horn Park Pond by Silvio O. Conte National Fish and Wildlife Refuge staff. No other recent data are available. The Aquatic Life Use of Lower Van Horn Park Pond will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

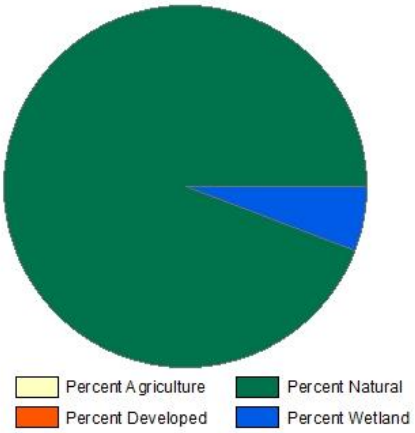
There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Lower Van Horn Park Pond (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Manhan River (MA34-10)

Location:	Headwaters, northeast of Norwich Pond, Huntington to inlet Tighe Carmody Reservoir, Southampton (through former 2006 segment: White Reservoir MA34100).
AU Type:	RIVER
AU Size:	6.6 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

Manhan River - MA34-10

Watershed Area: 6.98 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	6.97	4.36	1.35	0.84
Agriculture	0.9%	0.4%	0.7%	0.1%
Developed	0.6%	0.5%	0.3%	0.3%
Natural	92.7%	92.3%	84.1%	82.1%
Wetland	5.7%	6.7%	14.8%	17.6%
Impervious Cover	0.7%			

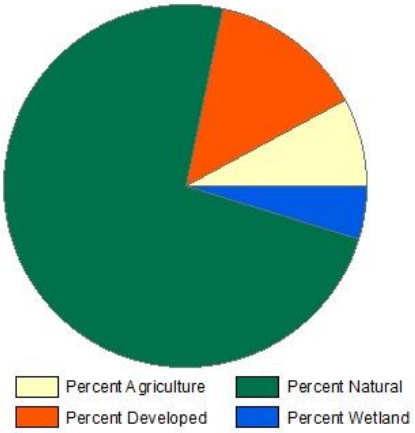
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for this Manhan River AU (MA34-10) so it is Not Assessed.

Manhan River (MA34-11)

Location:	Outlet Tighe Carmody Reservoir, Southampton to mouth at confluence with Connecticut River, Easthampton.
AU Type:	RIVER
AU Size:	19 MILES
Classification/Qualifier:	B

Manhan River - MA34-11

Watershed Area: 143.20 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	143.17	10.64	32.85	2.99
Agriculture	7.8%	16.7%	8.1%	14%
Developed	13.9%	33.6%	12%	25.2%
Natural	73.7%	40.7%	69.2%	45.1%
Wetland	4.7%	9.1%	10.7%	15.8%
Impervious Cover	5%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
MassDEP staff conducted water quality monitoring in the Manhan River during the summer of 2008 at Gun Rd, Southampton (W1793) and further downstream of the Manhan River dam at Fort Hill Rd, Easthampton (W1065). Discrete sampling data in the river at Gun Road were indicative of good conditions as follows: minimum DO 7.9mg/L, maximum saturation 102%, maximum temperature 22.8°C, pH range from 6.7 to 7.4 SU (n=5), seasonal average total phosphorus concentration 0.032mg/L (maximum 0.07mg/L), and no observations of dense/very dense filamentous algae noted. Further downstream at Fort Hill Rd the minimum DO measured during the five-day probe deployments was 6.93mg/L (mean minimum DOs ranging from 7.24 to 8.07mg/L during the deploys in May, June and July), the maximum saturation was 101.2%, the maximum diel DO shift was 1.45mg/L, and the maximum temperature was 22.5°C. Discrete pH measurements ranged from 6.8 to 7.2SU and the seasonal average total phosphorus concentration was 0.042mg/L (maximum 0.078mg/L) and no observations of dense/very dense filamentous algae were noted. USGS also collected nutrient and chloride samples in the river in April and August 2005 (site USGS-01171940) in the vicinity of DEP site W1065 with low concentrations being reported. Lastly there is an infestation of the non-native aquatic macrophyte, *Trapa natans* (Water Chestnut) in the lower portion of the Manhan River in the vicinity of Oxbow.

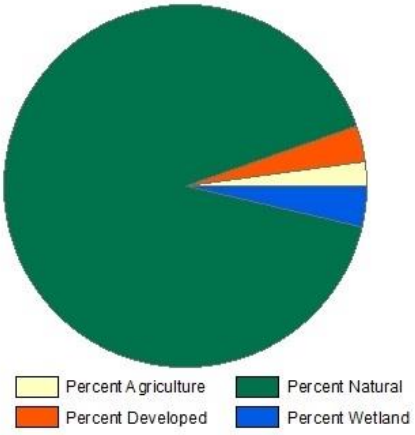
The Aquatic Life Use of this Manhan River AU (MA34-11) is assessed as Not Supporting due to the infestation of the non-native *Trapa natans* in the river near Oxbow. It should be noted that the other water quality data collected by MassDEP and USGS were indicative of good instream conditions. The former Alert for elevated TP in the vicinity of W1065 is being removed based on these newer data.

MEEKIN BROOK (MA34-72)

Location:	Headwaters north of Route 143, Chesterfield to mouth at confluence with West Branch Mill River, Williamsburg.
AU Type:	RIVER
AU Size:	2.7 MILES
Classification/Qualifier:	B

MEEKIN BROOK - MA34-72

Watershed Area: 2.34 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.34	2.34	0.45	0.45
Agriculture	2.2%	2.21%	3.19%	3.19%
Developed	3.2%	3.16%	3.53%	3.53%
Natural	91%	91.01%	90.26%	90.26%
Wetland	3.6%	3.61%	3.02%	3.02%
Impervious Cover	2.12%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Meekin Brook as a CFR and it is also a designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing along Rt 143, about ¼ mile east of Goshen town line, Williamsburg in August 2010 (SampleID 3515). The sample was comprised entirely of multiple age classes of Eastern brook trout.

The Aquatic Life Use of Meekin Brook is assessed as Fully Supporting based on presence of cold water fish (multiple age classes of Eastern brook trout).

Metacomet Lake (MA34051)

Location:	Belchertown.
AU Type:	FRESHWATER LAKE
AU Size:	51 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Fanwort*)		Added

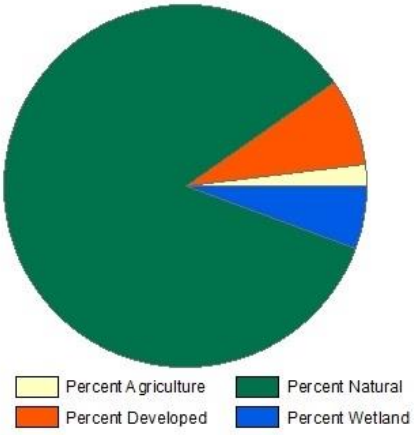
Fish, other Aquatic Life and Wildlife Use: Not Supporting
The MassDEP 1998 synoptic survey identified infestations of the non-native aquatic macrophytes, *Myriophyllum heterophyllum* (Variable-leaf milfoil) and *Cabomba caroliniana* (Fanwort), in Metacomet Lake. The Aquatic Life Use of Metacomet Lake will continue to be assessed as Not Supporting. The Dissolved Oxygen and Non-Native Aquatic Plants impairments are being carried forward and the species-specific fanwort (*Cabomba caroliniana*) impairment is being added.

MILL BROOK (MA34-55)

Location:	Headwaters, outlet Stevens Swamp, Warwick to mouth at confluence with Connecticut River, Northfield.
AU Type:	RIVER
AU Size:	7.7 MILES
Classification/Qualifier:	B: CWF

MILL BROOK - MA34-55

Watershed Area: 9.49 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	9.49	4.87	1.66	0.92
Agriculture	1.9%	3.63%	1.35%	2.43%
Developed	7.7%	14.15%	5.37%	9.48%
Natural	84.8%	79.69%	79.63%	84.12%
Wetland	5.6%	2.53%	13.66%	3.97%
Impervious Cover	1.92%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing at thirteen times along Mill Brook between August and September 2004 through 2013. The most upstream sample was collected upstream of Northfield Rd in Warwick (Sample ID 1758) and then another over the town line in Northfield at the Warwick turnaround (sample ID 1139). Nine samples were collected along Warwick Rd between Parker Camp Rd and School St (Sample IDs 4672, 1845, 2434, 3194, 4133, 964, 2068, 3003 & 3000). Two samples were collected a little further downstream of School Street with the most downstream location still upstream of Strowbridge Rd (Sample IDs 1355 & 3195). The samples were all dominated by fluvial fish and contained multiple age classes of Eastern Brook trout. Atlantic salmon and brown trout were also present in all samples.

The Aquatic Life Use of Mill Brook is assessed as Fully Supporting based on the presence of cold-water fish including mulitiple age classes of Eastern brook trout and other cold water species.

Mill Pond (MA34052)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	13 ACRES
Classification/Qualifier:	B

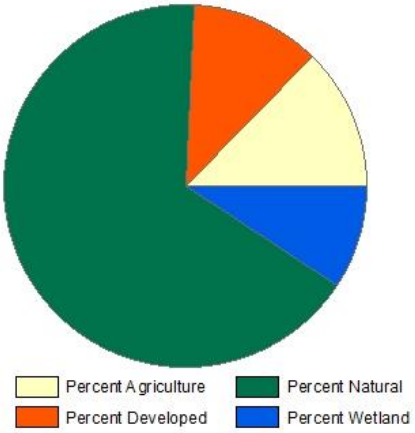
Fish, other Aquatic Life and Wildlife Use: Insufficient Information
No data are available to assess the Aquatic Life Use for Mill Pond so it is Not Assessed.

Mill River (MA34-24)

Location:	Headwaters east of Fisher Hill, Conway to mouth at confluence with the Connecticut River, Hatfield.
AU Type:	RIVER
AU Size:	24.6 MILES
Classification/Qualifier:	B

Mill River - MA34-24

Watershed Area: 49.02 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	49.01	8.41	11.82	2.14
Agriculture	12.6%	14.6%	13.6%	11.2%
Developed	11.6%	21.6%	10%	10.7%
Natural	66.6%	48.7%	58.3%	40.3%
Wetland	9.2%	15.1%	18.1%	37.8%
Impervious Cover	4.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
2	5	Temperature		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

MassDFG lists this Mill River AU (MA34-24) as a CFR. MassDFG biologists conducted backpack electrofishing in the Mill River three times upstream of the waterfall near Route 116, Conway Rd, Lee Rd in Conway in July/August 2005, 2006, and 2007. These samples (1496, 1148, and 2404) were all dominated by fluvial species and included Eastern brook trout, brown trout, or Atlanic salmon. Because of the presence of YOY Eastern brook trout in the upper reach of this Mill River should be assessed and protected as a Tier 1 Cold Water. Further downstream, two samples were collected downstream of the confluence with Roaring Brook; one off North St in Whately (Sample ID 2408) and one just North of Mountain Rd next to I-91 (Sample ID 2406). Neither of these samples had any Eastern brook trout or Tier 2 cold water fish but both were also dominated by numerous fluvial specialist/dependant species mostly moderately tolerant of pollution – a warmer water fishery. MassDEP staff conducted water quality monitoring at three locations in the lower half of the Mill River during the summer of 2008. At North Street, Whately (W1795) discrete sampling data can be summarized as follows: minimum DO 6.8mg/L, maximum saturation 95%, maximum temperature 23.0°C, pH ranged from 7.0 to 7.2SU (n=4), and seasonal average total phosphorus 0.03mg/L (maximum 0.049mg/L). Further downstream at Christian Lane, Whately (W2057) the single DO measurement was 8.0mg/L with a saturation of 89% and during the long term (67-day) thermistor deployment, the maximum temperature was 25.4°C with a maximum 7DADM of 24.5°C, and a maximum 7 DADA of 23.6°C

(above the chronic 7DADM Tier 1 CWF criteria of 20°C 61 times and the chronic 7DADM Tier 2 CWF criteria of 21°C 36 times) and maximum 24-hour rolling average of 24.4°C (above both the Tier 1 and Tier 2 acute criteria of 23.5 and 24.1°C, respectively). Finally, water quality sampling was also conducted in the river at Maple Street, Hatfield (W1061). During the five-day probe deployments in May, June and July the minimum DO was 6.45mg/L (mean minimum DO ranged from 6.71 to 7.48mg/L over the three deploys), the maximum saturation was 98.4%, the maximum diel DO shift was 0.94mg/L, and the maximum temperature was 23.4°C. A thermistor was also deployed (73-day) had a maximum temperature of 25.6°C with a maximum 7DADM of 25.2°C, and a maximum 7 DADA of 24.4°C (above the chronic 7DADM Tier 1 CWF criteria of 20°C 67 times and the chronic 7DADM Tier 2 CWF criteria of 21°C 40 times) and maximum 24-hour rolling average of 24.9°C (above both the Tier 1 and Tier 2 acute criteria of 23.5 and 24.1°C, respectively). pH ranged from 6.8-7.1 (n=6) and the seasonal average total phosphorus concentration (n=4 excluding the highest measurement of 0.085mg/L on September 9th two days after ~5"of rain on the 7th was recorded at the Amherst rain station since it was considered atypical of normal conditions) was 0.032mg/L (maximum 0.05mg/L).

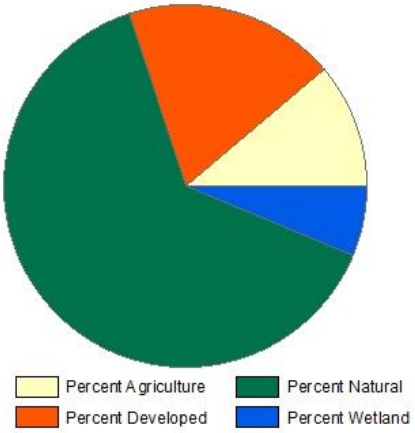
The Aquatic Life Use for this Mill River (Hatfield) AU (MA34-24) is assessed as Not Supporting. An Existing Use Tier 1 or 2 cold water was documented upstream of the waterfall near Route 116 South Deerfield as evidenced by the salmonid species present, while further downstream fluvial warm water species were present and water temperatures during the summer of 2008 were above acute and chronic criteria for Existing Use Tier 1 and 2 cold waters but met warm water standards. Aerial maps clearly indicate many farmed fields in close proximity to the river along much of its length.

Mill River (MA34-25)

Location:	Headwaters, outlet Factory Hollow Pond, Amherst to mouth at inlet Lake Warner, Hadley.
AU Type:	RIVER
AU Size:	5.2 MILES
Classification/Qualifier:	B

Mill River - MA34-25

Watershed Area: 30.04 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	30.04	11.21	8.04	2.26
Agriculture	11.1%	25%	8.5%	21.3%
Developed	18.9%	38.7%	10.1%	22.3%
Natural	63.7%	26.9%	69%	32.9%
Wetland	6.2%	9.4%	12.4%	23.5%
Impervious Cover	7.8%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing just upstream of the UMass property alongside Rt.116 in August 2006 (SampleID 1997). A total of 12 species were collected (83 individuals) and the sample was dominated by fluvial species indicative of good conditions for this low gradient stream. MassDEP staff conducted water quality monitoring further downstream (and downstream of the UMass property) at Mill River Lane, Hadley (W1050) during the summer of 2008. The minimum DO measured during the five-day unattended continuous probe deployments in May, June and July was 5.1mg/L (mean minimum DO concentrations ranging from 5.39 to 7.27mg/L), the maximum DO saturation was 98.0%, the maximum temperature was 21.4°C, and the max diel DO shift was 1.89mg/L. Discrete pH measurments ranged from 6.4 to 6.8SU; (n=7) and the seasonal average total phosphorus concentration was 0.036mg/L (maximum 0.077mg/L with only one measurement above 0.05mg/L).

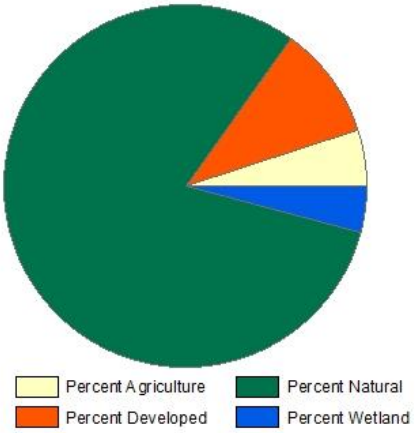
The Aquatic Life Use of this Mill River AU (MA34-25) is assessed as Fully Supporting based on the presence of fluvial fishes and the water quality data indicative of good conditions collected during the summer of 2008.

Mill River (MA34-28)

Location:	Headwaters (confluence of East and West Branch Mill River, Williamsburg), to outlet Paradise Pond, Northampton.
AU Type:	RIVER
AU Size:	10 MILES
Classification/Qualifier:	B

Mill River - MA34-28

Watershed Area: 54.40 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	54.39	4.59	12.78	1.17
Agriculture	5%	10.4%	5.7%	9.6%
Developed	10.1%	44.1%	11.5%	29.3%
Natural	80.8%	41.8%	74.2%	54.7%
Wetland	4.1%	3.7%	8.6%	6.4%
Impervious Cover	3.7%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)

MassDFG lists Mill River as a CFR. MassDFG biologists conducted backpack electrofishing eight times throughout the AU in August each year from 2006 to 2013. The sampling was conducted along Rt.9 in Williamsburg near River Rd crossing (SampleIDs 4635, 3609, 4112, 2075 & 3216), across from Kellogg Rd (Sample ID 2452), by the Brassworks (Sample ID 1807) and across from the vet office (Sample ID 2948). The samples were all comprised of entirely fluval species including multiple age classes of Eastern brook trout and slimy sculpin, as well as other salmonids (brown trout and Atlantic salmon). This river will be assessed as a Tier 1 Cold Water since multiple age classes of Eastern brook trout and slimy sculpin were collected. MassDEP biologists collected a benthic macroinvertebrate sample ~60m upstream from Clement Street, Northampton (B0634) in July 2008. The RBPIII analysis indicated the sample was "Non impaired", with 95% comparability to the Amethyst Brook reference station (B0514). MassDEP staff also conducted water quality monitoring at Clement Steet (W1976) during the summer of 2008. The minimum DO measured during the five-day probe deployments in May, June and July was 8.29mg/L (mean minimum DO during the three deploys ranged from 8.44 to 9.11mg/L), the maximum saturation was 108.7%, and the maximum diel DO shift was 1.24mg/L, the maximum temperature was elevated for a Tier 1 Cold Water (maximum 22.4°C) with 4DADM above 20°C during the June and July deployes (21.8, 21.0°C, respectively). Discrete pH measurement ranged from 7.1 to 7.4SU (n=6) and the seasonal average total phosphorus was low (0.02mg/L, maximum 0.051mg/L). USGS staff also conducted limited nutrient and chloride sampling in the river at Clement Street, Northampton (April and August 2005) with no exceedances found.
The Aquatic Life Use of this Mill River AU (MA34-28) is assessed as Fully Supporting based on the excellent condition of the benthic and fish communities, and except for elevated temperature, the excellent water quality

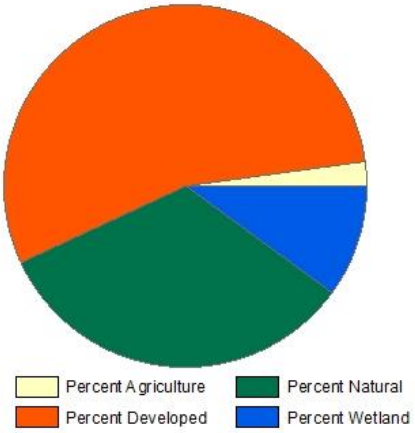
conditions. An Alert is being identified becaue of elevated temperature since the 4DADM exceeded 20°C (the Tier 1 Existing Use chronic criterion) in June and July 2008.

Mill River (MA34-29)

Location:	Headwaters, outlet Watershops Pond, Springfield to mouth at confluence with Connecticut River, Springfield. (Interrupted stream).
AU Type:	RIVER
AU Size:	1.3 MILES
Classification/Qualifier:	B: CSO

Mill River - MA34-29

Watershed Area: 33.72 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	33.71	4.79	6.46	0.79
Agriculture	2.2%	0%	2%	0%
Developed	54.7%	79.3%	35.3%	57%
Natural	33.1%	18.6%	39.4%	39.3%
Wetland	10%	2%	23.4%	3.7%
Impervious Cover	21.1%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	Trash		Changed

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

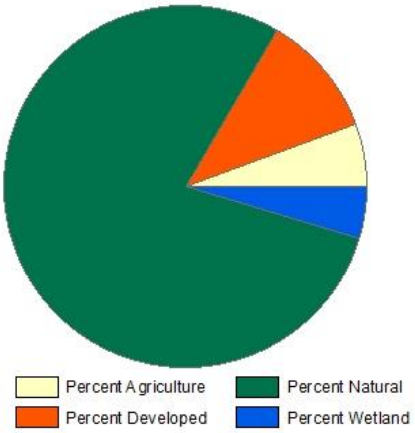
MassDEP staff conducted water quality monitoring in this Mill River AU (MA24-29) approximately 225 ft upstream of Mill Street, Springfield (W1786), during the summer of 2008. The minimum DO was 6.93mg/L during the five-day unattended probe deployments in June, July and September (mean minimum DOs ranged from 7.18 to 8.32mg/L during the three deploys). The maximum saturation was 99.8%, the maximum diel DO shift was 1.15mg/L, and the maximum temperature was 26.2°C. Discrete pH measurements ranged from 6.9 to 8.7SU (n=7) and the seasonal average total phosphorus concentration (n=4 excluding the extremely high measurement of 0.33mg/L on September 9th two days after ~5"of rain on the 7th was recorded at the Amherst rain station since it was considered atypical of normal conditions) was 0.046mg/L (maximum of 0.063mg/L). It should be noted that there are several Springfield CSOs at the top of this AU (#24, #25 & #48) located upstream of the sampling location. The Aquatic Life Use of Mill River is assessed as Fully Supporting based on the water quality data collected during the summer of 2008.

Mill River Diversion (MA34-32)

Location:	Headwaters, outlet Paradise Pond, Northampton to mouth at confluence with Oxbow (east of Old Springfield Road), Northampton (through former 2006 segment: Hulberts Pond MA34036).
AU Type:	RIVER
AU Size:	2.5 MILES
Classification/Qualifier:	B

Mill River Diversion - MA34-32

Watershed Area: 57.08 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	57.07	5.00	13.45	1.31
Agriculture	5.6%	13.2%	6%	11.1%
Developed	10.9%	35.5%	11.9%	24.9%
Natural	78.9%	40.4%	72.5%	47.1%
Wetland	4.6%	10.9%	9.6%	16.9%
Impervious Cover	4.2%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
3	4c	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Hulberts Pond impoundment of the Mill River Diversion.

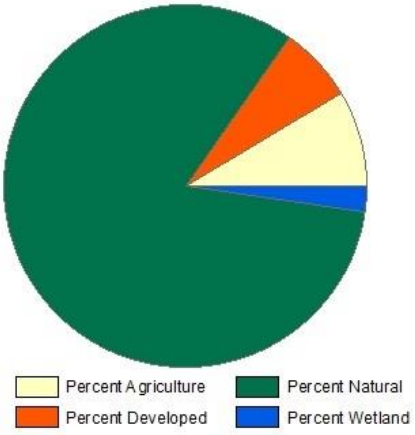
The Aquatic Life Use of the Mill River Diversion is assessed as Not Supporting because of the presence of the non-native aquatic macrophyte water chestnut (*Trapa natans*) in the Hulberts Pond impoundment.

MILLERS BROOK (MA34-90)

Location:	Headwaters southwest of Stratton Mountain, Northfield to mouth at confluence with the Connecticut River, Northfield.
AU Type:	RIVER
AU Size:	3.8 MILES
Classification/Qualifier:	B

MILLERS BROOK - MA34-90

Watershed Area: 5.49 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	5.49	5.42	1.18	1.18
Agriculture	8.5%	8.64%	8.81%	8.81%
Developed	6.8%	6.87%	8.76%	8.76%
Natural	82.3%	82.19%	76.98%	76.98%
Wetland	2.3%	2.3%	5.45%	5.45%
Impervious Cover	1.81%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Millers Brook as a CFR and it is a designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Millers Brook at the Gulf Rd Northfield crossing in August 2005 (SampleID 1140). The sample was comprised entirely of multiple age classes of Eastern brook trout and slimy sculpin.

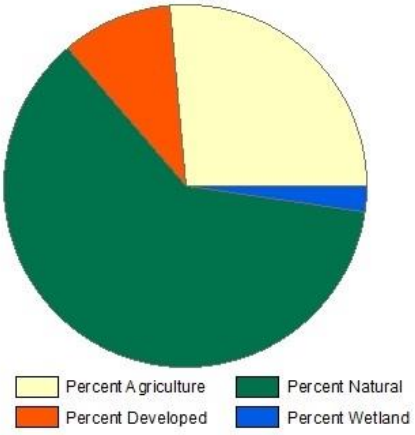
The Aquatic Life Use of Millers Brook is assessed as Fully Supporting based on presence of the cold-water fish (multiple age classes of Eastern brook trout and slimy sculpin) which are indicative of excellent habitat and water quality conditions.

MOHAWK BROOK (MA34-82)

Location:	Headwaters, outlet Greene Swamp, Sunderland to mouth at confluence with Connecticut River, Hadley.
AU Type:	RIVER
AU Size:	3.4 MILES
Classification/Qualifier:	B

MOHAWK BROOK - MA34-82

Watershed Area: 3.94 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.94	3.09	1.22	1.03
Agriculture	26.3%	33.58%	32.69%	38.7%
Developed	9.9%	12.37%	9.79%	11.39%
Natural	61.4%	51.23%	51.63%	43.31%
Wetland	2.3%	2.82%	5.9%	6.6%
Impervious Cover	4.38%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

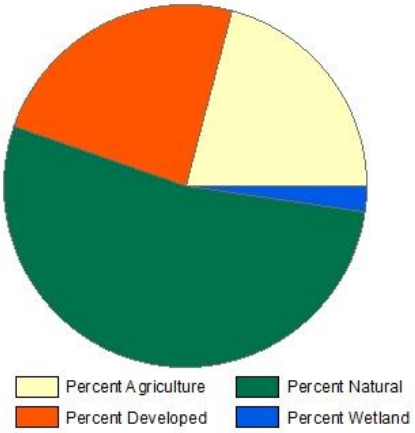
MassDFG lists Mowhawk Brook as a CFR and it is a designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Mohawk Brook off Silver Rd, ½ mile upstream of Cross Rd, Sunderland in 2007 (SampleID 2148). Sampling was downstream from the Sunderland Trout Hatchery as upstream of the hatchery was dry. The sample was comprised entirely with intolerant fluvial specialist species and was dominated by multiple age classes of brown trout (fish almost all above stocking size however).
The Aquatic Life Use of Mowhawk Brook is assessed as Fully Supporting based presence of cold-water fluvial fish species.

Moose Brook (MA34-17)

Location:	Headwaters, perennial portion, Southampton to mouth at confluence with Manhan River, Southampton.
AU Type:	RIVER
AU Size:	2.6 MILES
Classification/Qualifier:	B: CWF

Moose Brook - MA34-17

Watershed Area: 2.69 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.69	2.69	0.48	0.48
Agriculture	20.8%	20.8%	13.8%	13.8%
Developed	23.9%	23.9%	20.4%	20.4%
Natural	53%	53%	61.1%	61.1%
Wetland	2.3%	2.3%	4.7%	4.7%
Impervious Cover	6.3%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

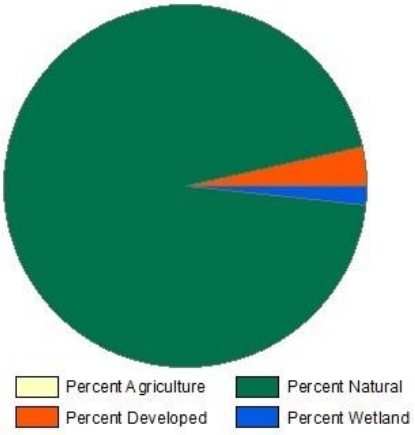
MassDEP staff conducted limited water quality monitoring in Moose Brook near Moose Brook Rd, Southampton (W1787) during the summer of 2008. Discrete measurments were taken (not predawn) and can be summarized as follows: mimimum DO 8.6mg/L, maximum saturation 103%, maximum temperature 17.8°C, and pH ranged from 6.9 to 7.5SU. The seasonal average total phosphorus concentration (n=4 excluding the extremely high measurement of 0.33mg/L on September 9th two days after ~5"of rain on the 7th was recorded at the Amherst rain station since it was considered atypical of normal conditions) was 0.023mg/L (maximum of 0.03mg/L). The Aquatic Life Use of Moose Brook will be assessed as Fully Supporting based on the limited water quality data collected during the summer of 2008 that were indicative of good conditions.

MOUNTAIN BROOK (MA34-81)

Location:	Headwaters west of Brushy Mountain, Leverett to mouth at confluence with Doolittle Brook, Leverett.
AU Type:	RIVER
AU Size:	2.3 MILES
Classification/Qualifier:	B

MOUNTAIN BROOK - MA34-81

Watershed Area: 1.10 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.10	1.10	0.36	0.36
Agriculture	0.2%	0.25%	0.51%	0.51%
Developed	3.5%	3.49%	1.83%	1.83%
Natural	94.6%	94.57%	93.98%	93.98%
Wetland	1.7%	1.69%	3.69%	3.69%
Impervious Cover	0.28%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Mountain Brook as a CFR and is a designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Mountain Brook downstream of Shutesbury Road in Leverett in August 2013 (SampleID 4990). The sample was comprised solely by young Eastern brook trout.
The Aquatic Life Use of Mountain Brook is assessed as Fully Supporting based on presence of young Eastern brook trout.

Mountain Street Reservoir (MA34056)

Location:	Williamsburg/Hatfield/Whately.
AU Type:	FRESHWATER LAKE
AU Size:	67 ACRES
Classification/Qualifier:	A: PWS, ORW

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Mountain Street Reservoir so it is Not Assessed.

Nashawannuck Pond (MA34057)

Location:	Easthampton.
AU Type:	FRESHWATER LAKE
AU Size:	30 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
An infestation of *Trapa natans* (Water Chestnut) was observed in Nashawannuck Pond by Silvio O. Conte National Fish and Wildlife Refuge staff. No other recent data are available. The Aquatic Life Use of Nashawannuck Pond will continue to be assessed as Not Supporting with Nutrient/Eutrophication Biological Indicators and Total Phosphorus impairments being carried forward. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte Water Chestnut impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic “Non-Native Aquatic Plants” to the specific macrophyte “Water Chestnut”.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Nashawannuck Pond (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic “Non-Native Aquatic Plants” to the specific macrophyte “Water Chestnut”.

Nine Mile Pond (MA34127)

Location:	Wilbraham (formerly reported as 2000 segment: Nine Mile Pond MA36107).
AU Type:	FRESHWATER LAKE
AU Size:	33 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed (Alert)
The presence of *Myriophyllum* sp. in Nine Mile Pond was reported by DCR staff in 2003. No other recent data are available. The Aquatic Life Use of Nine Mile Pond is Not Assessed but an Alert is being identified because of the potential presence of a non-native *Myriophyllum* sp.

Noonan Cove (MA34058)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	3 ACRES
Classification/Qualifier:	B

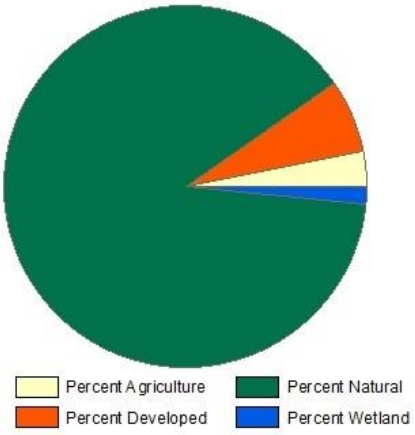
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Noonan Cove, so it is Not Assessed.

NORTH BRANCH MANHAN RIVER (MA34-54)

Location:	Headwaters, perennial portion, north of Northwest Road, Westhampton to mouth at confluence with Manhan River, Easthampton/Southampton.
AU Type:	RIVER
AU Size:	9.2 MILES
Classification/Qualifier:	B: CWF

NORTH BRANCH MANHAN RIVER - MA34-54

Watershed Area: 5.48 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	5.48	3.82	1.07	0.86
Agriculture	3.1%	4.32%	4.27%	5.26%
Developed	6.6%	7.65%	9.09%	10.27%
Natural	88.8%	86.82%	81.95%	81.68%
Wetland	1.5%	1.21%	4.69%	2.79%
Impervious Cover	3.2%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in the North Branch Manhan River fourteen times in August and September between 2005 and 2013. Seven samples were collected off Easthampton Road in Westhampton (SampleIDs 2924, 2087, 4648, 3207, 1824, 4116 & 2431). The remaining samples were collected further downstream off Loudville Rd/Mineral Street in Easthampton (Sample IDs 3206, 2429, 4117, 1358, 1826, 2086 & 4647). Multiple age classes of Eastern Brook trout and other salmonids were present in the samples. MassDEP biologists conducted benthic macroinvertebrate sampling ~215m downstream of Rt. 66, Northampton in July 2008 (Sample ID B0641). The RBPIII analysis indicated the sample was "Non-impaired" with 85% comparability to the Amethyst Brook reference station (B0514). MassDEP staff also conducted water quality monitoring in the river at Pomeroy Meadow Rd, Easthampton/Southampton (W1797) during the summer of 2008. All data was indicative of good water quality for a cold water fishery. Attended probes (n=5): pH ranged from 6.7 to 7.2SU; maximum temperature was 19.9°C; the minimum DO was 8.2mg/L, and the maximum saturation was 104%. The seasonal average total phosphorus concentration was low 0.019mg/L (maximum 0.03mg/L).

The Aquatic Life Use of the North Branch Manhan River is assessed as Fully Supporting based on the cold-water fish sample data (2005 through 2013), as well as the good benthic macroinvertebrate community and water quality data collected during the summer of 2008.

Northampton Reservoir (MA34059)

Location:	Whately.
AU Type:	FRESHWATER LAKE
AU Size:	80 ACRES
Classification/Qualifier:	A: PWS, ORW

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Northampton Reservoir, so it is Not Assessed.

Northfield Mountain Reservoir (MA34061)

Location:	Erving.
AU Type:	FRESHWATER LAKE
AU Size:	237 ACRES
Classification/Qualifier:	B

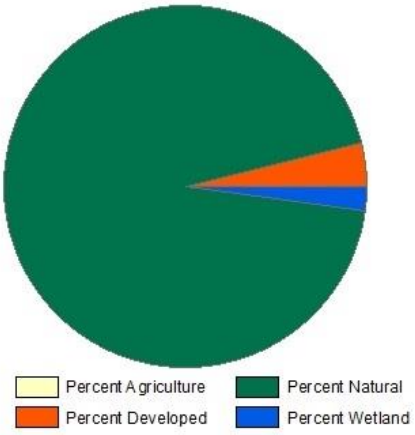
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Northfield Mountain Reservoir so it is Not Assessed.

NURSE BROOK (MA34-59)

Location:	Headwaters, west of Pratt Corner Road, Shutesbury to mouth at confluence with Adams Brook (in small "diversion pool" for Atkins Reservoir), Shutesbury.
AU Type:	RIVER
AU Size:	1.2 MILES
Classification/Qualifier:	A: PWS, ORW, CWF (Tributary)

NURSE BROOK - MA34-59

Watershed Area: 1.21 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.21	1.21	0.52	0.52
Agriculture	0%	0%	0%	0%
Developed	3.8%	3.8%	3.47%	3.47%
Natural	94.1%	94.06%	92.72%	92.72%
Wetland	2.1%	2.14%	3.81%	3.81%
Impervious Cover	1.52%			

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Nurse Brook so it is Not Assessed.

Oxbow (MA34066)

Location:	The waterbody west of Route 91 (bounded on the northeast by Route 91, the southeast by the Manhan River, and the west by Old Springfield Road), Northampton/Easthampton (excluding the delineated segment; Danks Pond MA34019).
AU Type:	FRESHWATER LAKE
AU Size:	149 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
An infestation of the non-native aquatic macrophyte, *Trapa natans*, is present in Oxbow. The Aquatic Life Use of Oxbow will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Oxbow (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Oxbow Cutoff (MA34067)

Location:	The waterbody north of Island Road and south of Oxbow Road (between Routes 91and 5), Northampton.
AU Type:	FRESHWATER LAKE
AU Size:	49 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Non-Native Aquatic Plants*)		Removed
4c	4c	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting
An infestation of the non-native aquatic macrophyte, *Trapa natans*, is present in Oxbow Cutoff. The Aquatic Life Use of Oxbow Cutoff will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

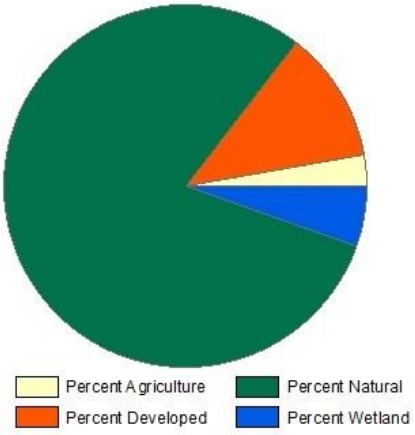
There is an infestation of the non-native aquatic macrophyte, *Trapa natans*, in Oxbow Cutoff (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

PARSONS BROOK (MA34-66)

Location:	Headwaters west of Sylvester Road, Northampton to mouth at confluence with Bassett Brook, Northampton.
AU Type:	RIVER
AU Size:	3.1 MILES
Classification/Qualifier:	B

PARSONS BROOK - MA34-66

Watershed Area: 3.60 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.60	3.60	0.90	0.90
Agriculture	2.7%	2.71%	5.99%	5.99%
Developed	11.8%	11.8%	14.21%	14.21%
Natural	80.1%	80.1%	69.04%	69.04%
Wetland	5.4%	5.38%	10.75%	10.75%
Impervious Cover	4.42%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG lists Parsons Brook as a CFR though it is NOT currently a designated Cold Water in the propsed SWQS. MassDFG biologists conducted backpack electrofishing in the very upper reach of the brook at the Sylvester Rd crossing, Northampton in August 2010 (SampleID 3518). The sample was comprised of two fluvial species and was dominated by multiple age classes of Eastern brook trout.

It should be noted that Parsons Brook loses much gradient and picks up the runoff from a gravel pit downstream where the fish sample was collected. The brook is primarily low gradient.

While the headwater reach of Parsons Brook supports multiple age classes of Eastern brook trout, most of the stream downstream from that site is low gradient so there is Insufficient Information to assess the Aquatic Life Use of Parsons Brook.

Pine Island Lake (MA34069)

Location:	Westhampton.
AU Type:	FRESHWATER LAKE
AU Size:	55 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Pine Island Lake, so it is Not Assessed.

Plympton Brook Pond (MA34071)

Location:	Wendell.
AU Type:	FRESHWATER LAKE
AU Size:	5 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Plympton Brook Pond, so it is Not Assessed.

Porter Lake (MA34073)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	28 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Curly-leaf Pondweed*)		Added
5	5	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Not Supporting
The MassDEP Herbicide Database indicates that yearly applications have been filed between 2006-2016 to treat the non-native aquatic macrophyte, *Potamogeton crispus* (Curly-leaf Pondweed), in Porter Lake MA34073. The Aquatic Life Use of Porter Lake will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte Curly-leaf Pondweed impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic “Non-Native Aquatic Plants” to the specific macrophyte “Curly-leaf Pondweed”.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

The MassDEP Herbicide Database indicates that yearly applications have been filed between 2006-2016 to treat the non-native aquatic macrophyte, *Potamogeton crispus*, in Porter Lake MA34073 (MassDEP 2017). The impairment was changed from the generic “Non-Native Aquatic Plants” to the specific macrophyte “Curly-leaf Pondweed”.

Porter Lake West (MA34072)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	5 ACRES
Classification/Qualifier:	B

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Removed

Fish, other Aquatic Life and Wildlife Use: Insufficient Information
American lotus, Nelumbo lutea, was reported on the field sheet from the MassDEP 1998 synoptic survey and erroneously denoted as non-native. Porter Lake West was then listed as impaired for Non-Native Aquatic Plants in 2008. In reality, no non-native aquatic plants have been reported in Porter Lake West, so this impairment is being removed. With the removal of non-native aquatic plants, there is insufficient information data available to assess the Aquatic Life Use of Porter Lake West.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Data and/or information lacking to determine WQ status; original basis for listing was incorrect	American lotus, Nelumbo lutea, was reported on the field sheet from the MassDEP 1998 synoptic survey and erroneously denoted as non-native. Porter Lake West was then listed as impaired for Non-Native Aquatic Plants in 2008. In reality, no non-native aquatic plants have been reported in Porter Lake West, so this impairment is being removed.

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

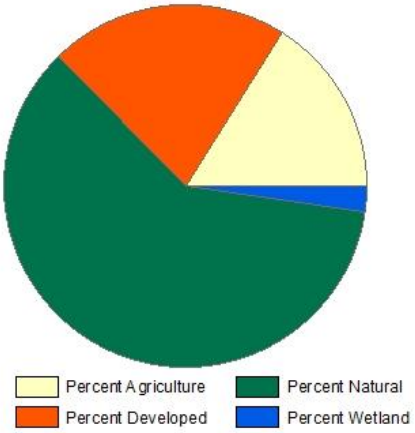
American lotus, *Nelumbo lutea*, was reported on the field sheet from the MassDEP 1998 synoptic survey and erroneously denoted as non-native (MassDEP 1998). Porter Lake West was then listed as impaired for Non-Native Aquatic Plants in 2008 (MassDEP 2015). In reality, no non-native aquatic plants have been reported in Porter Lake West, so this impairment should be removed.

Potash Brook (MA34-12)

Location:	Headwaters, perennial portion, Southampton to confluence with Manhan River, Southampton.
AU Type:	RIVER
AU Size:	1 MILES
Classification/Qualifier:	B

Potash Brook - MA34-12

Watershed Area: 0.85 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.85	0.85	0.20	0.20
Agriculture	16%	16%	23.4%	23.4%
Developed	21.4%	21.4%	11.6%	11.6%
Natural	60.3%	60.3%	57%	57%
Wetland	2.3%	2.3%	7.9%	7.9%
Impervious Cover	9.5%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

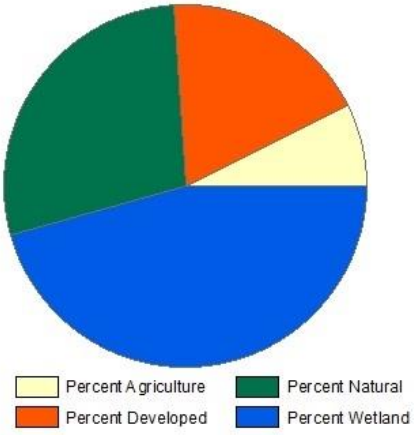
MassDFG biologists conducted backpack electrofishing at one location at the top of the AU at the High Street crossing, Southampton in August 2002 (SampleID 745). The sample was dominated by fluvial specialist species and also a small number of the moderately tolerant macrohabitat generalist species (Pumpkinseed).
Too limited (older) data are available to assess the Aquatic Life Use of Potash Brook, so it is assessed as having Insufficient Information.

Raspberry Brook (MA34-22)

Location:	From Massachusetts/Connecticut border to mouth at confluence with Connecticut River, Longmeadow.
AU Type:	RIVER
AU Size:	1.8 MILES
Classification/Qualifier:	B

Raspberry Brook - MA34-22

Watershed Area: 1.13 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.89	0.89	0.25	0.25
Agriculture	7.3%	7.3%	0%	0%
Developed	18.7%	18.7%	15.5%	15.5%
Natural	28.4%	28.4%	40.1%	40.1%
Wetland	45.6%	45.6%	44.3%	44.3%
Impervious Cover	7.5%			

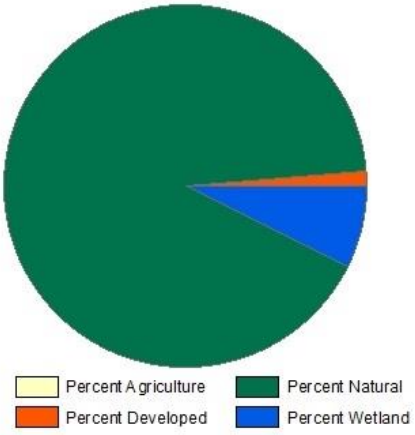
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Raspberry Brook so it is Not Assessed.

RED BROOK (MA34-88)

Location:	Headwaters, perennial portion, east of Jourdan Road, Montgomery to mouth at confluence with Tucker Brook, Southampton.
AU Type:	RIVER
AU Size:	0.8 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

RED BROOK - MA34-88

Watershed Area: 0.99 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.99	0.99	0.17	0.17
Agriculture	0.3%	0.29%	0%	0%
Developed	1.3%	1.26%	0%	0%
Natural	91.2%	91.18%	90.08%	90.08%
Wetland	7.3%	7.28%	9.92%	9.92%
Impervious Cover	0.66%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Red Brook as a CFR and it is designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in the upper reach of this Red Brook AU (MA34-88) off a private road from Jourdan Rd, Montgomery in September 2013 (SampleID 4693). The sample was comprised exclusively by salmonids with multiple age classes of Eastern brook trout.

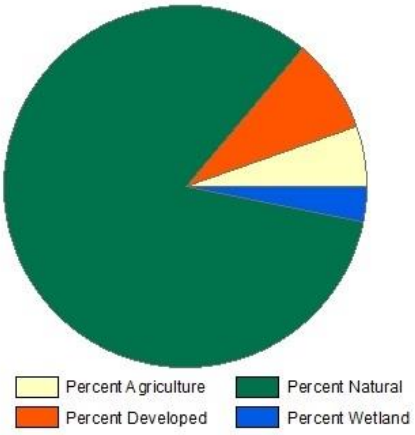
The Aquatic Life Use of this Red Brook AU (MA34-88) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout.

RED BROOK (MA34-92)

Location:	Headwaters north of Maple Street, Southampton to mouth at confluence with Manhan River impoundment (Lyman Pond) backwater, Southampton.
AU Type:	RIVER
AU Size:	2.6 MILES
Classification/Qualifier:	B

RED BROOK - MA34-92

Watershed Area: 2.32 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.32	2.32	0.57	0.57
Agriculture	5.4%	5.45%	1.39%	1.39%
Developed	8.4%	8.42%	9.5%	9.5%
Natural	83%	83.03%	83.34%	83.34%
Wetland	3.1%	3.1%	5.77%	5.77%
Impervious Cover	2.66%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG lists Red Brook as a CFR and it is designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in this Red Brook AU (MA34-92) near the Russelville Road crossing, Southampton in August 2002 (SampleID 749). The sample was represented almost entirely by fluvial fish including multiple age classes of Eastern brook trout (a small number of individuals) but the sample was dominated by the fluvial specialists blacknose dace and creek chub.

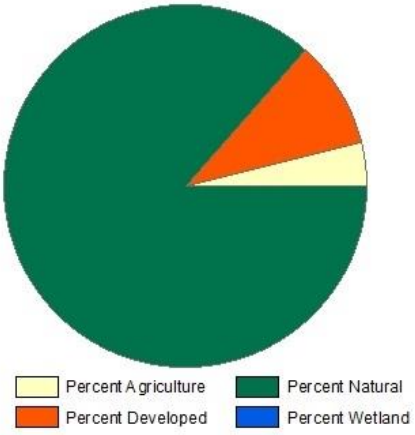
Too limited data (dated) are available to assess the Aquatic Life Use for this Red Brook AU (MA32-92) so it is assessed as having Insufficient Information. It should however be protected as a Tier 1 Cold Water based on the presence of multiple age classes of Eastern brook trout.

RICE BROOK (MA34-47)

Location:	Headwaters, perennial portion, south of Burt Road, Westhampton to mouth at confluence with Sodom Brook, Westhampton.
AU Type:	RIVER
AU Size:	1.1 MILES
Classification/Qualifier:	B: CWF

RICE BROOK - MA34-47

Watershed Area: 1.60 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.60	1.60	0.30	0.30
Agriculture	3.9%	3.88%	13.13%	13.13%
Developed	9.6%	9.61%	14.02%	14.02%
Natural	86.3%	86.27%	71.92%	71.92%
Wetland	0.2%	0.24%	0.92%	0.92%
Impervious Cover	2.53%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG biologists conducted backpack electrofishing in Rice Brook at the Farm off North Rd, Westhampton in August 2002 (SampleID 746). The sample was comprised of multiple age classes of Eastern brook trout as well as other salmonids.

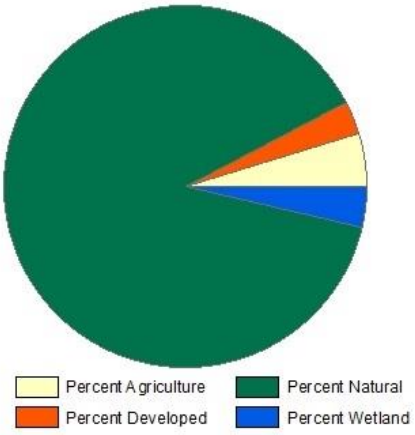
Too limited data (dated) are available to assess the Aquatic Life Use for Rice Brook so it is assessed as having Insufficient Information.

ROARING BROOK (MA34-63)

Location:	From the outlet of Whately Glen Reservoir (South Deerfield Water Supply Dam, NATID: MA00522), Whatley to mouth at confluence with Mill River, Whately.
AU Type:	RIVER
AU Size:	1.4 MILES
Classification/Qualifier:	B

ROARING BROOK - MA34-63

Watershed Area: 5.78 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	5.78	4.49	1.56	1.24
Agriculture	4.7%	4.89%	3.35%	3.28%
Developed	3%	3.02%	1.63%	1.62%
Natural	88.6%	88.49%	86.64%	86.24%
Wetland	3.6%	3.6%	8.38%	8.86%
Impervious Cover	1.42%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Roaring Brook as a CFR and it is a designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Roaring Brook at North Street (across from the New England Wildflower society) Whately in August 2007 (SampleID 2410). The sample dominated by fluvial fish including multiple age classes of Eastern brook trout. MassDEP biologists collected a benthic macroinvertebrate sample approximately 100m downstream of North Street, Whately in July 2008 (Sample ID B0639). The RBPIII analysis indicated the sample was "slightly impaired", with 75% comparability to the Amethyst Brook reference station (B0514). MassDEP staff also conducted water quality monitoring at North Street, Whately (W1788) during the summer of 2008. These discrete sample data were indicative of good conditions as follows: minimum DO 8.7mg/L, maximum saturation 102%, maximum temperature 20.3°C, pH ranged from 7.5 to 7.7SU, seasonal average total phosphorus concentration 0.006mg/L (maximum 0.007mg/L). The Town of South Deerfield is permitted (MAG640005) to discharge drinking water filter backwash to Roaring Brook. In September 2008 river water was collected ~30ft upstream of the South Deerfield Water Supply Dam, upstream of the discharge from Roaring Brook WTF for use as dilution water in the facility's WET test. Survival of *C. dubia* exposed to the river water was excellent (100%) and no acute or chronic whole effluent toxicity was detected in the Roaring Brook WTF effluent either (LC_{50} and CNOEC >100 and 100% effluent, respectively).

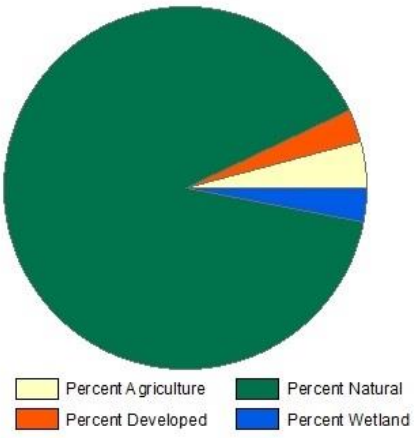
The Aquatic Life Use of this Roaring Brook AU (MA34-63) is assessed as Fully Supporting based on the good biological conditions (good benthos and presence of fluvial fish including multiple age classes of Eastern brook trout), no evidence of any toxicity, and the good water quality conditions.

ROARING BROOK (MA34-79)

Location:	Headwaters northwest of Cricket Hill, Conway to the outlet of Whately Glen Reservoir (South Deerfield Water Supply Dam, NATID: MA00522), Whately (excluding the approximately 0.4 miles through the Conway Reservoir (Roaring Brook Dam NATID: MA01056)).
AU Type:	RIVER
AU Size:	4 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

ROARING BROOK - MA34-79

Watershed Area: 5.22 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	5.22	5.22	1.41	1.41
Agriculture	4.1%	4.09%	2.49%	2.49%
Developed	3%	2.97%	1.2%	1.2%
Natural	90%	89.98%	89.7%	89.7%
Wetland	3%	2.95%	6.61%	6.61%
Impervious Cover	1.31%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Roaring Brook as a CFR and it is a designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in this Roaring Brook AU (MA34-79) with two samples collected at the Cricket Hill Rd in Conway in July 2006 and August 2007 (SampleIDs 1495 & 2221) and third sample collected further downstream at the Roaring Brook Rd crossing (above the reservoir) in August 2007 (Sample ID 2422). The samples collected upstream were comprised entirely by multiple age classes of Eastern brook trout while the downstream sample also had other fluvial species as well as the moderately tolerant macrohabitat generalist pumpkinseed.

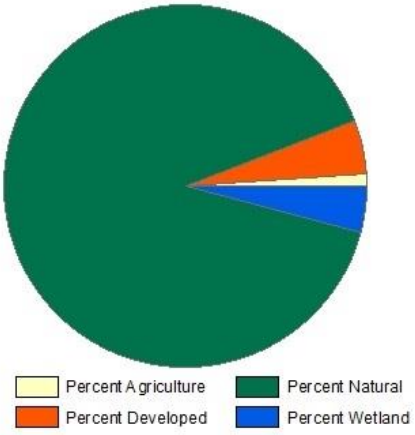
The Aquatic Life Use for this Roaring Brook AU (MA34-79) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout which are indicative of excellent habitat and water quality conditions.

ROARING BROOK (MA34-80)

Location:	Headwaters outlet wetland east of Montague Road, Shutesbury to mouth at confluence with Doolittle Brook, Leverett.
AU Type:	RIVER
AU Size:	4.3 MILES
Classification/Qualifier:	B

ROARING BROOK - MA34-80

Watershed Area: 7.39 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	7.39	4.40	2.52	1.62
Agriculture	1.1%	1.23%	1.8%	2.11%
Developed	4.7%	4.04%	3.53%	4.14%
Natural	90.1%	93.27%	88.07%	90.74%
Wetland	4.1%	1.46%	6.59%	3%
Impervious Cover	2.39%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists this Roaring Brook AU (MA34-80) as a CFR and it is currently a designated Cold-Water stream in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in August 2006 off Shutesbury Rd, Shutesbury (SampleID 1992) and further downstream off Teewaddle Hill Rd, Leverett (Sample ID 1991). Both samples were comprised entirely by fluvial fish including multiple age classes of Eastern brook trout and brown trout.

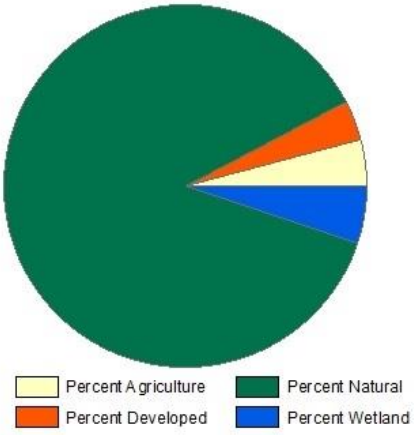
The Aquatic Life Use of this Roaring Brook AU (MA34-80) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook and brown trout indicative of excellent habitat and water quality conditions.

ROBERTS MEADOW BROOK (MA34-68)

Location:	Headwaters south of Old Curtis Road, Chesterfield to mouth at inlet Robers Meadow Reservoir, Northampton.
AU Type:	RIVER
AU Size:	6.2 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

ROBERTS MEADOW BROOK - MA34-68

Watershed Area: 9.67 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	9.67	7.17	1.81	1.60
Agriculture	4.1%	5.43%	6.96%	7.64%
Developed	3.6%	4.01%	4.68%	4.89%
Natural	87.2%	85.08%	76.18%	75.56%
Wetland	5.1%	5.47%	12.19%	11.91%
Impervious Cover	1.34%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Roberts Meadow Brook as a CFR and it is designated Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Roberts Meadow Brook in August 2006 in the upper reach of the brook (SampleIDs 1986, 1985) and documented multiple age classes of Eastern brook trout and slimy sculpin. Another sampling effort in September 2013 at Kennedy Road crossing Northampton (SampleID 4836) also resulted in the capture of these and other fluvial species upstream of the Upper Roberts Meadow Reservoir Dam. Backpack electrofishing in the downstream reaches (sampleIDs 4837 and 4838) were well represented by fluvial species but cold-water species were absent. The Upper Roberts Meadow Reservoir Dam (Northampton) was removed (after years of preparatory work) over the summer of 2018.

The Aquatic Life Use of Roberts Meadow Brook is assessed as Fully Supporting based on the presence of cold water fish (multiple age classes of Eastern brook trout and slimy sculpin) in the upper reach of the brook and the habitat restoration project (Upper Roberts Meadow Reservoir Dam removal) that was completed in 2018.

Roberts Meadow Reservoir (MA34076)

Location:	Northampton.
AU Type:	FRESHWATER LAKE
AU Size:	22 ACRES
Classification/Qualifier:	A: PWS, ORW

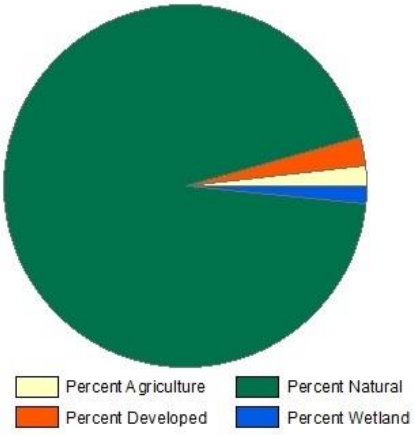
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Roberts Meadow Reservoir, so it is Not Assessed.

ROGERS BROOK (MA34-51)

Location:	Headwaters east of Oak Hill Road near the Goshen/Ashfield border to mouth at confluence with West Branch Mill River, Goshen.
AU Type:	RIVER
AU Size:	2.6 MILES
Classification/Qualifier:	B: CWF

ROGERS BROOK - MA34-51

Watershed Area: 2.59 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.59	2.59	0.46	0.46
Agriculture	1.8%	1.82%	1.42%	1.42%
Developed	2.6%	2.57%	3.4%	3.4%
Natural	94%	94.03%	89.62%	89.62%
Wetland	1.6%	1.58%	5.57%	5.57%
Impervious Cover	1.21%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in Rogers Brook north of Wing Hill Rd, on DAR property, Goshen in July 2007 (SampleID 2111) and further downstream upstream of the road to Hull Forest Prod, off East St, Goshen in August 2007 (Sample ID 2076). Both samples were well represented by multiple age classes of Eastern brook trout.

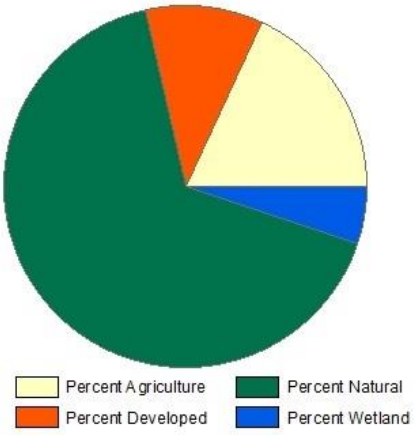
The Aquatic Life Use of Rogers Brook is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout indicative of excellent habitat and water quality conditions.

RUSSELLVILLE BROOK (MA34-62)

Location:	Headwaters, Route 116, Sunderland (river name changes at bridge from Long Plain Brook SARIS# 3420350) to mouth at confluence with the Connecticut River, Hadley.
AU Type:	RIVER
AU Size:	4.4 MILES
Classification/Qualifier:	B

RUSSELLVILLE BROOK - MA34-62

Watershed Area: 7.27 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	7.27	1.89	1.76	0.49
Agriculture	18%	45.54%	13.86%	31.71%
Developed	10.6%	15.31%	8.41%	7.43%
Natural	66.3%	30.28%	64.59%	36.34%
Wetland	5.1%	8.87%	13.13%	24.51%
Impervious Cover	5.59%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in Russellville Brook at the Rt.47 crossing, Hadley in September 2013 (SampleID 4697). The sampling reach was low gradient stream and there were noted made the brook was dry further upstream. A few fluvial specialist species represented 23% of the sampling including the moderately tolerant tesselated darter and a couple of larger rainbow trout (probably stocked). MassDEP staff also conducted water quality monitoring in Russellville Brook at the Rt.47 crossing (W1802) during the summer of 2008. These discrete data were indicative of good conditions as follows: minimum DO 7.2mg/L, maximum saturation 88%, maximum temperature 16^{o}C, pH ranged from 6.6 to 6.8SU (n=5), and the seasonal average total phosphorus concentration was low (0.048mg/L, maximum 0.054mg/L).

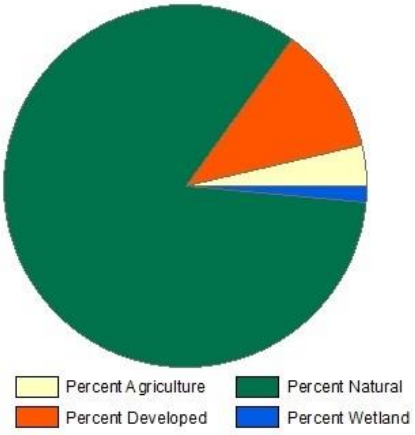
The Aquatic Life Use of Russellville Brook is assessed as Fully Supporting based on the presence of fluvial specialist fish species and the water quality data indicative of good conditions.

SACKET BROOK (MA34-45)

Location:	Headwaters, perennial portion, north of Southampton Road, Montgomery to mouth at confluence with Manhan River, Southampton.
AU Type:	RIVER
AU Size:	2.1 MILES
Classification/Qualifier:	B: CWF

SACKET BROOK - MA34-45

Watershed Area: 1.81 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.81	1.81	0.71	0.71
Agriculture	3.6%	3.6%	1.93%	1.93%
Developed	11.4%	11.41%	6.44%	6.44%
Natural	83.6%	83.59%	89.13%	89.13%
Wetland	1.4%	1.4%	2.5%	2.5%
Impervious Cover	3.51%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG biologists conducted backpack electrofishing in Sacket Brook at the Russelville Road crossing, Southampton in August 2002 (SampleID 808). The sample was comprised almost entirely by fluvial species including multiple age classes of Eastern brook trout and slimy sculpin in good abundance.

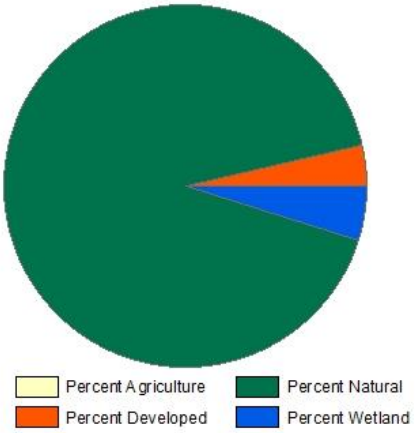
Too limited data (dated) are available to assess the Aquatic Life Use for Sacket Brook, so it is assessed as having Insufficient Information.

Sawmill River (MA34-40)

Location:	Headwaters, outlet Lake Wyola, Shutesbury to Dudleyville Road, Leverett (formerly part of 2006 segment: Sawmill River MA34-26).
AU Type:	RIVER
AU Size:	2 MILES
Classification/Qualifier:	B

Sawmill River - MA34-40

Watershed Area: 13.02 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	13.02	10.47	2.76	2.48
Agriculture	0.7%	0.5%	0.5%	0.6%
Developed	3.6%	3.7%	6.4%	6.9%
Natural	90.9%	90.5%	81.2%	80.3%
Wetland	4.8%	5.2%	11.9%	12.1%
Impervious Cover	1.7%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Sawmill River as a CFR although it is currently not a designated Cold-Water stream in the SWQS. MassDFG biologists conducted backpack electrofishing at three locations in the lower half of this Sawmill River AU (MA34-40) along North Leveret Rd in Leverett. Two samples were collected in August 2010 and September 2012 approx. 3/4 mile east of Moores Corner (SampleID's 4131 & 3202) and the third sample was a little further downstream 0.3mi northeast of Rattlesnake Gutter Rd (Sample ID 2081) in September 2007. All samples were dominated by fluvial species indicative of good water quality conditions with multiple age classes of Atlantic salmon a consistent presence for all sample years. Except for the sample noted as having limited sampling efficiency, mulitple age classes or young of year Eastern brook trout were documented.

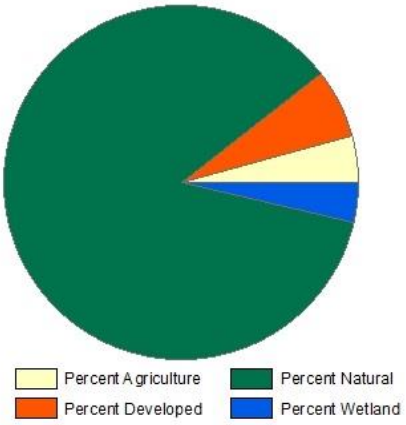
The Aquatic Life Use of Sawmill River is assessed as Fully Supporting based on presence of fluvial fish including multiple age classes of cold-water species (Eastern brook trout, brown trout, Altantic salmon).

Sawmill River (MA34-41)

Location:	Dudleyville Road, Leverett to mouth at confluence with Connecticut River, Montague (formerly part of 2006 segment: Sawmill River MA34-26).
AU Type:	RIVER
AU Size:	11 MILES
Classification/Qualifier:	B: CWF

Sawmill River - MA34-41

Watershed Area: 31.98 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	31.98	6.53	7.69	2.23
Agriculture	4.2%	16.3%	6.4%	19.3%
Developed	6.3%	12.8%	9.5%	12%
Natural	86%	66.5%	74.9%	58.8%
Wetland	3.6%	4.3%	9.2%	9.9%
Impervious Cover	2.6%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing at six locations in the middle reach of this Sawmill River AU (MA34-41). One sample was collected in September 2005 along N. Leverett Rd, ~1mile upstream of Rt.63, N. Leverett (SampleID 1346) and then the remaining samples were collected ~1/2mile upstream of Rt.63 but still east of the railroad line, in Montague (Sample IDs 1817 in August 2006, 4130 in September 2012, 2082 in September 2007, 4680 in September 2013 and 3201 in August 2010). All samples contained slimy sculpin as well as multiple age classes of Eastern brook trout, brown trout, and/or and Atlantic salmon and other fluvial species. MassDEP biologists also collected a benthic macroinvertebrate sample in Sawmill River upstream of South Ferry Road, Montague, in July 2008 (Sample ID B0515). The RBPIII analysis indictated the sample was “non impaired”, with 90% comparability to the Amethyst Brook reference station (B0514). USGS staff conducted very limited water quality monitoring in the lower reach of the river at the Meadow Rd crossing in April and August 2005. Chloride met acute and chronic criterion and the average total phosphorus was low (0.01mg/L). MassDEP staff also conducted water quality monitoring upstream of South Ferry Road, Montague (W1048) during the summer of 2008. Discrete sampling data were indicative of good conditions as follows: minimum DO 8.8mg/L, maximum saturation 102%, maximum temperature 19.4^{o}C, pH ranged from 6.8 to 7.0SU (n=4), seasonal average total phosphorus concentration 0.009mg/L (maximum 0.013mg/L). There were no observations of dense/very dense filamentous algae present.

The Aquatic Life Use for this Sawmill River AU (MA34-41) will continue to be assessed as Fully Supporting based on the good benthic community, the dominance of fluvial species and presence of cold-water fish species including slimy sculpin, and the water quality data indicative of good cold water conditions.

Sawyer Ponds (MA34078)

Location:	[North Basin] Northfield.
AU Type:	FRESHWATER LAKE
AU Size:	9 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for this Sawyer Ponds AU (MA34078) so it is Not Assessed.

Sawyer Ponds (MA34079)

Location:	[South Basin] Northfield.
AU Type:	FRESHWATER LAKE
AU Size:	12 ACRES
Classification/Qualifier:	B

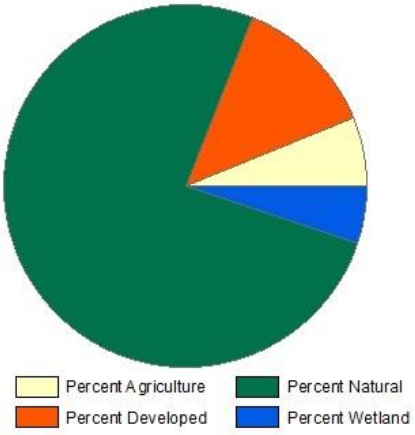
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for this Sawyer Ponds AU (MA34079) so it is Not Assessed.

Scantic River (MA34-30)

Location:	Massachusetts/Connecticut border, Monson downstream to the Massachusetts/Connecticut border, Hampden.
AU Type:	RIVER
AU Size:	9.6 MILES
Classification/Qualifier:	B

Scantic River - MA34-30

Watershed Area: 25.03 square miles (Includes area outside Massachusetts)



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	21.41	4.51	5.38	1.13
Agriculture	6.1%	8%	6.1%	9.4%
Developed	12.9%	24.1%	11.9%	26.1%
Natural	75.9%	60.2%	68.8%	44.3%
Wetland	5.1%	7.7%	13.3%	20.2%
Impervious Cover	3.6%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDEP staff deployed a thermistor in the Scantic River ~25 feet upstream of the Temple Brook confluence, Hampden (W2059) during the summer of 2008. The maximum temperature recorded during this 76-day deployment was 24.1 °C (maximum 7 DADM 23.1°C, maximum 24-hour rolling average 22.2°C) always meeting acute and chronic temperature criterion for a warm water fishery. MassDEP biologists conducted barge electrofishing in the Scantic River ~a half mile upstream of Chapin Rd, Hampden in September 2011 (SampleID 4611). The sample was described as having fair efficiency and was dominated by fluvial dependent/specialist species moderately tolerant to pollution. In the middle of the AU ~2330 ft upstream of Chapin Road, Hampden (W2225) long term temperature data were collected during the summers of 2011 and 2012. Long term temperature logger deployments recorded maximum temperatures in the summer of 2011 of 27.3 °C and in the summer of 2012 26.3°C also meeting warm water criteria. Further downstream at Mill Rd, Hampden (W1789) MassDEP also conducted water quality monitoring during the summer of 2008. The long-term (76-day) thermistor recorded a maximum temperature of 23.1°C (maximum 7 DADM 22.4°C, maximum 24-hour rolling average 22.1°C). Discrete sampling data can be summarized as follows: minimum DO 9.0mg/L, maximum saturation 103%, pH ranged from 6.5 to 7.0SU (n=5), the seasonal average total phosphorus concentration was low (0.015mg/L, maximum 0.02 mg/L). There were no observations of dense/very dense filamentous algae present.

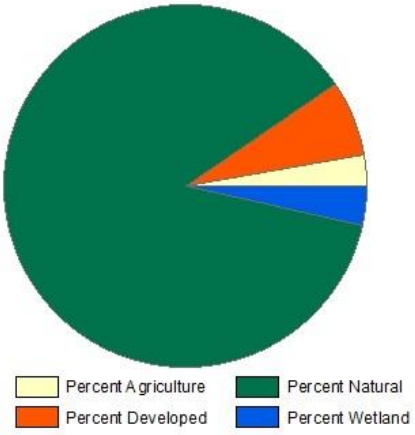
The Aquatic Life Use of Scantic River will continue to be assessed as Fully Supporting based on the presence of fluvial dependent/specialist fish species and the water quality data all meeting warm water criteria and indicative of good conditions.

SCARBORO BROOK (MA34-46)

Location:	Headwaters, outlet Scarboro Pond, Belchertown to mouth at confluence with Hop Brook, Belchertown.
AU Type:	RIVER
AU Size:	2.3 MILES
Classification/Qualifier:	B: CWF

SCARBORO BROOK - MA34-46

Watershed Area: 3.02 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.02	2.95	0.61	0.61
Agriculture	2.8%	2.88%	5.04%	5.04%
Developed	6.7%	6.84%	7.05%	7.05%
Natural	87%	86.72%	82.38%	82.38%
Wetland	3.5%	3.56%	5.53%	5.53%
Impervious Cover	3.14%			

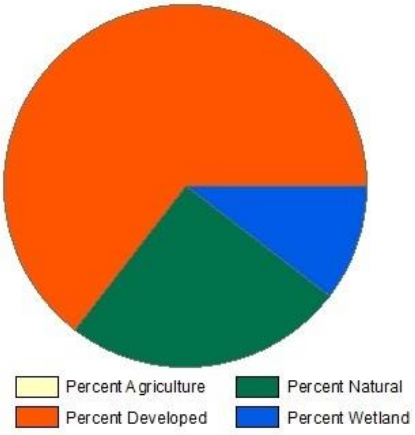
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG biologists conducted backpack electrofishing in the upper reach of Scarboro Brook downstream of North Gulf Rd near the Pelham Country Club in Belchertown in August 2005 (SampleID 1219). The sample was comprised of two fluvial species including multiple age classes of Eastern brook trout. The Aquatic Life Use of Scarboro Brook is assessed as Fully Supporting based on the presence of fluvial fish including multiple age classes of Eastern brook trout.

SCHNEELOCK BROOK (MA34-44)

Location:	Headwaters, west of Newhouse Street, Springfield to mouth at confluence with South Branch Mill River, Springfield.
AU Type:	RIVER
AU Size:	1.3 MILES
Classification/Qualifier:	B: CWF

SCHNEELOCK BROOK - MA34-44

Watershed Area: 1.39 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.39	1.39	0.34	0.34
Agriculture	0.4%	0.43%	0%	0%
Developed	64.3%	64.33%	43.25%	43.25%
Natural	25%	24.96%	34.06%	34.06%
Wetland	10.3%	10.28%	22.69%	22.69%
Impervious Cover	23.9%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG biologists conducted backpack electrofishing in the lower reach of Shneelock Brook downstream of the South Branch Parkway, Springfield in July 2002 (SampleID 757). The sample was comprised entirely of fluvial species including multiple age classes of Eastern Brook trout.

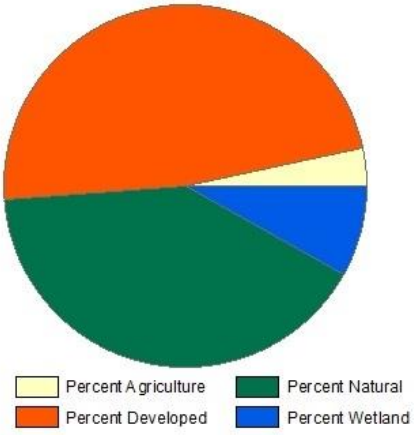
Too limited (dated) data are available to assess the Aquatic Life Use of Schneelock Brook so it is assessed as having Insufficient Information.

SCHOOLHOUSE BROOK (MA34-43)

Location:	Headwaters, southeast of Connor Reservoir, Holyoke to mouth at confluence with Goldine Brook, West Springfield.
AU Type:	RIVER
AU Size:	3.1 MILES
Classification/Qualifier:	B: CWF

SCHOOLHOUSE BROOK - MA34-43

Watershed Area: 2.40 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.40	2.40	0.80	0.80
Agriculture	3.4%	3.42%	2.05%	2.05%
Developed	47.8%	47.85%	38.54%	38.54%
Natural	40.6%	40.63%	48%	48%
Wetland	8.1%	8.1%	11.4%	11.4%
Impervious Cover	18.13%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG biologists conducted backpack electrofishing in Schoolhouse Brook at Althea Street, West Springfield in July 2002 (SampleID 769). The sample was dominated by multiple age classes of Eastern Brook trout along with a few slimy sculpin and American eel.

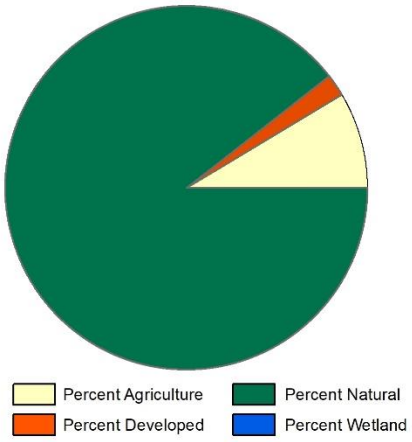
Too limited (dated) data are available to assess the Aquatic Life Use of Schoolhouse Brook so it is assessed as having Insufficient Information.

SHATTUCK BROOK (MA34-57)

Location:	Headwaters, confluence Keets and Beaver Meadow brooks, Leyden to mouth at confluence with Fall River, Bernardston.
AU Type:	RIVER
AU Size:	2.4 MILES
Classification/Qualifier:	B: CWF

SHATTUCK BROOK - MA34-57

Watershed Area: 2.19 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.19	2.19	0.15	0.15
Agriculture	8.55%	8.5%	6.45%	6.45%
Developed	1.96%	1.9%	2.19%	2.19%
Natural	89.05%	89.04%	90.35%	90.35%
Wetland	0.68%	0.68%	1.6%	1.6%
Impervious Cover	0.01%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in Shattuck Brook at ten locations in August/September 2004 through 2013 (excluding 2011). Samples were collected in the upper section of the AU just below the dam site along Keets Brook Rd (SampleIDs 2935 & 4132); halfway down the AU along Keets Brook Rd (SampleIDs 1848, 2438, 1345) and towards the bottom of the AU along Brooks Rd approximately 1/3 of a mile from Rt.5 Bernardston (Sample IDs 2071, 971, 3173, 2936, 4664). All of the samples were dominated by fluvial species including multiple age classes of Eastern brook trout and slimy sculpin. MassDEP biologists also collected a benthic macroinvertebrate sample approximately 370m upstream from Keets Brook Road Branch intersection (B0640), in July 2008. The RBPIII analysis indicated the sample was “not impaired”, with 85% comparability to the Amethyst Brook reference station (B0514).

The Aquatic Life Use for Shattuck Brook (MA34-57) is assessed as Fully Supporting based on the good benthic community and presence of multiple age classes of Eastern brook trout and slimy sculpin all indicative of excellent habitat and water quality conditions.

Silver Lake (MA34084)

Location:	Agawam.
AU Type:	FRESHWATER LAKE
AU Size:	9 ACRES
Classification/Qualifier:	B

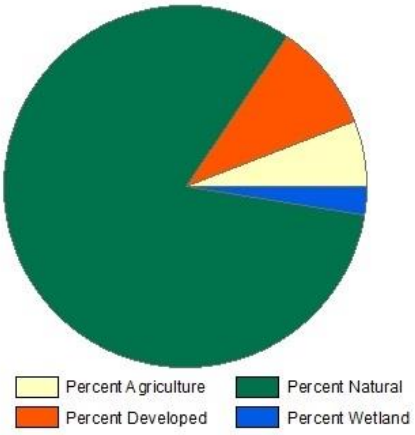
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Silver Lake, so it is Not Assessed.

SODOM BROOK (MA34-53)

Location:	Headwaters, outlet small unnamed pond north of Crowley Road, Westhampton to mouth at confluence with North Branch Manhan River, Westhampton.
AU Type:	RIVER
AU Size:	3.1 MILES
Classification/Qualifier:	B: CWF

SODOM BROOK - MA34-53

Watershed Area: 6.41 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	6.41	6.25	1.14	1.14
Agriculture	5.8%	5.99%	9.08%	9.08%
Developed	9.7%	9.98%	12.13%	12.13%
Natural	82%	81.55%	74.03%	74.03%
Wetland	2.5%	2.48%	4.75%	4.75%
Impervious Cover	3.28%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing at eight times in the lower half Sodom Brook between August /September 2005 through 2013 (excluding 2011). All the samples were collected in the vicinity of the Southampton Rd crossing, the most upstream location behind the high school, ranging to downstream of Southampton Rd (Samples IDs 1348, 4111, 2430, 4623, 3208, 1825, 2088, 2923). The samples were dominated by fluvial species including multiple age classes of Eastern brook trout and some other salmonids including abundant Atlantic salmon.

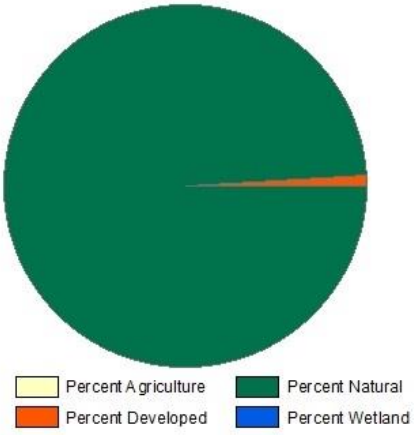
The Aquatic Life Use of Sodom Brook is assessed as Fully Supporting based on the presence of fluvial fishes including multiple age classes of Eastern brook trout and other salmonid species indicative of excellent habitat and water quality conditions.

SPAULDING BROOK (MA34-85)

Location:	Headwaters west of Chestnut Hill, Montague to mouth at confluence with Sawmill River, Montague.
AU Type:	RIVER
AU Size:	1.5 MILES
Classification/Qualifier:	B

SPAULDING BROOK - MA34-85

Watershed Area: 1.60 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.60	1.60	0.25	0.25
Agriculture	0.5%	0.54%	0.53%	0.53%
Developed	1%	0.95%	2.82%	2.82%
Natural	97.6%	97.6%	93.09%	93.09%
Wetland	0.9%	0.9%	3.56%	3.56%
Impervious Cover	0.19%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Spaulding Brook (MA34-85) as a CFR and is also a designated Cold Water in the propsed SWQS. MassDFG biologists conducted backpack electrofishing in Spaulding Brook near Ripley Rd, in August 2005 and August 2006 (Sample IDs 1289 & 1514). The samples were comprised entirely by multiple age classes of Eastern brook trout.

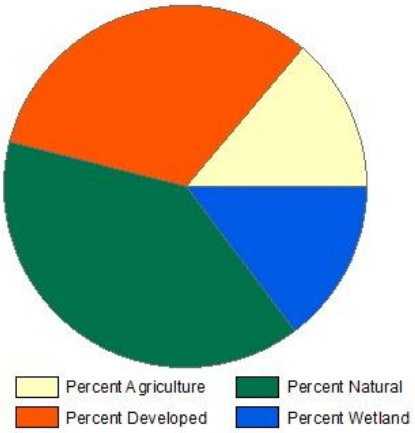
The Aquatic Life Use for Spaulding Brook is assessed as Fully Supporting based on presence of multiple age classes of Eastern brook indicative of excellent habitat and water quality conditions.

Stony Brook (MA34-19)

Location:	Headwaters, Granby to mouth at confluence with Connecticut River, South Hadley (through former 2006 segments: Upper Pond MA34095 and Lower Pond MA34049).
AU Type:	RIVER
AU Size:	13.3 MILES
Classification/Qualifier:	B: CSO

Stony Brook - MA34-19

Watershed Area: 22.78 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	22.77	5.99	5.04	1.61
Agriculture	13.8%	13.3%	16%	11.3%
Developed	32.3%	46.3%	19.7%	28.6%
Natural	39.3%	31.3%	33%	38.6%
Wetland	14.7%	9.1%	31.3%	21.5%
Impervious Cover	9.4%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

An infestation of non-native aquatic macrophyte, *Trapa natans* (Water Chestnut) was observed in the Upper Pond impoundment of Stony Brook during the MassDEP 1998 synoptic survey and was observed in the Upper and Lower Pond by Silvio O. Conte National Fish and Wildlife Refuge staff. The Lower Pond and Upper Pond are both now part of the Stony Brook AU. MassDEP staff conducted water quality monitoring at in Stony Brook during the summer of 2008 at the Morgan Street crossing closest to Edison Drive, South Hadley (W1790). The discrete sampling data can be summarized as follows: minimum DO 5.4mg/L, maximum saturation 83%, maximum temperature 21.6°C, pH ranged from 6.6-6.9SU (n=5), seasonal average total phosphorus concentration 0.058mg/L (maximum 0.071 mg/L), with one observation of dense or very dense filamentous algae. MassDEP staff also conducted benthic samping immediately upstream of first footbridge east of Route 116, South Hadley (B0635) in July 2008. The RBPIII analysis indicated the sample was "Non-Impaired" with 85% comparability with the Amethyst Brook reference station (B0514). MassDEP staff also conducted water quality sampling just upstream from the Route 116 crossing, South Hadley (W1792). The minimum DO was 7.67mg/L during the five-day probe deployments in May, June and July (mean minimum DOs ranged between 8.12 and 8.56mg/L for the three

deploys). The maximum DO saturation was 104.2%, with a maximum diel DO shift of 0.93mg/L and a maximum temperature of 25.1°C. Discrete pH measurements ranged from 6.9 to 7.6SU, the seasonal average total phosphorus concentration was 0.054mg/L (maximum 0.065 mg/L) and there were two observations of dense or very dense filamentous algae noted.
The Aquatic Life Use of Stony Brook will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added. All other data collected (benthic and water quality monitoring during the summer of 2008) were indicative of good conditions.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

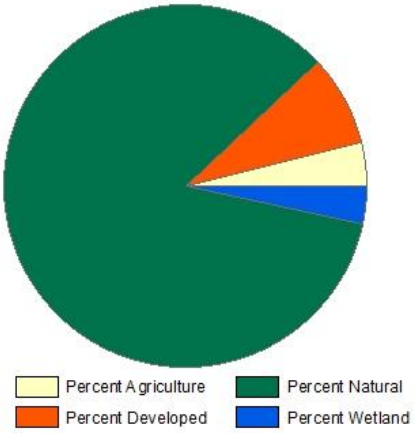
During the MassDEP 1998 synoptic survey, the non-native aquatic macrophyte, *Trapa natans*, was documented in the Upper Pond (MassDEP 1998). Additionally, the Silvio O. Conte National Fish and Wildlife Refuge staff reported that there is an infestation of *Trapa natans*, in the Upper AND Lower Pond (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The Lower Pond and Upper Pond are now part of the Stony Brook AU. The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Temple Brook (MA34-08)

Location:	Headwaters, outlet Bradley Pond, Monson to mouth at confluence with Scantic River, Hampden.
AU Type:	RIVER
AU Size:	3.6 MILES
Classification/Qualifier:	B

Temple Brook - MA34-08

Watershed Area: 4.23 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.23	4.21	1.11	1.11
Agriculture	3.8%	3.8%	4.8%	4.8%
Developed	8.1%	8.2%	8.5%	8.5%
Natural	84.7%	84.6%	77.2%	77.2%
Wetland	3.4%	3.5%	9.5%	9.5%
Impervious Cover	2.7%			

Fish, other Aquatic Life and Wildlife Use: Insufficient Information

MassDFG lists Temple Brook as a CFR though it is currently not a designated Cold-Water stream in the SWQS. MassDEP staff deployed two thermistors in the brook during the summer of 2008 with the maximum temperature at Scantic Rd, Hampden (W2121) of 21.8°C (maximum 7DADM 21.3°C and above 20.0°C nine times) during the 76-day deployment, and at the confluence with Scantic River, Hampden (W2058) the maximum temperature was 21.7 °C maximum 7DADM 20.5°C and above 20.0°C seven times) during the 53-day deployment.

Too limited data are available to assess the Aquatic Life Use for Temple Brook, so it is assessed as having Insufficient Information.

Tighe Carmody Reservoir (MA34089)

Location:	Southampton.
AU Type:	FRESHWATER LAKE
AU Size:	353 ACRES
Classification/Qualifier:	A: PWS, ORW

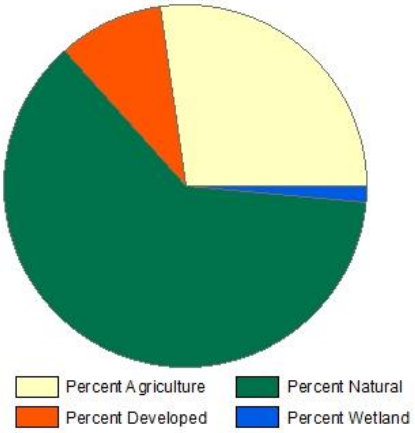
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Tighe Carmody Reservoir, so it is Not Assessed.

Tripple Brook (MA34-16)

Location:	Headwaters, perennial portion, Southampton to mouth at confluence with Manhan River, Southampton.
AU Type:	RIVER
AU Size:	1 MILES
Classification/Qualifier:	B: CWF

Tripple Brook - MA34-16

Watershed Area: 0.94 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.94	0.94	0.22	0.22
Agriculture	27.2%	27.2%	29.1%	29.1%
Developed	9.4%	9.4%	7%	7%
Natural	62%	62%	61.7%	61.7%
Wetland	1.4%	1.4%	2.2%	2.2%
Impervious Cover	3.8%			

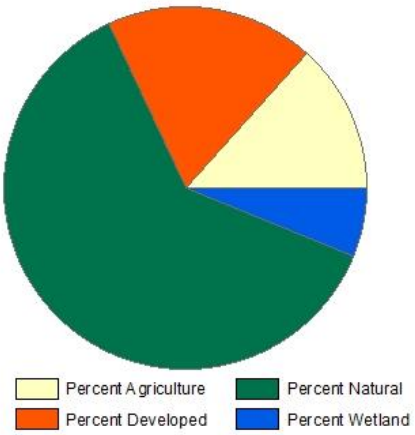
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Tripple Brook, so it is Not Assessed.

Unnamed Tributary (MA34-31)

Location:	Headwater, outlet Lake Warner, Hadley to mouth at confluence with Connecticut River, Hadley.
AU Type:	RIVER
AU Size:	0.5 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA34-31

Watershed Area: 31.74 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	31.73	7.56	8.52	1.43
Agriculture	13.3%	35.9%	10.6%	28.1%
Developed	18.6%	29.3%	10.6%	20.1%
Natural	62%	24.8%	66.7%	25.7%
Wetland	6.1%	10.1%	12.1%	26.1%
Impervious Cover	7.7%			

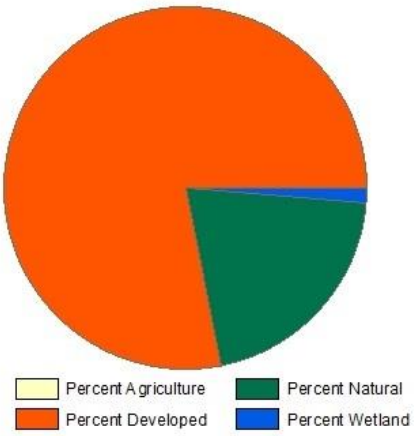
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for this Unnamed Tributary AU (MA34-31) so it is Not Assessed.

Unnamed Tributary (MA34-60)

Location:	Unnamed tributary to the Connecticut River, locally known as 'Willimansett Brook', headwaters, perennial portion, east of Memorial Drive (Route 33), Chicopee to mouth at confluence with Connecticut River, Chicopee (approximately 1200 feet culverted near mouth).
AU Type:	RIVER
AU Size:	2.3 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA34-60

Watershed Area: 2.91 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.91	2.91	0.54	0.54
Agriculture	0.7%	0.69%	0.79%	0.79%
Developed	77.5%	77.54%	47.74%	47.74%
Natural	20.4%	20.43%	46.59%	46.59%
Wetland	1.3%	1.34%	4.89%	4.89%
Impervious Cover	34.42%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting (Alert)

MassDEP staff conducted limited water quality sampling in this Unnamed Tributary to Connecticut River locally known as "Willamansett Brook", at Yelle Street, Chicopee (W1798) during the summer of 2008. The discrete sample data can be summarized as follows: minimum DO 10.4mg/L, maximum saturation 108%, maximum temperature 19.0°C, pH ranged from 6.9-7.4SU (n=5). The seasonal average total phosphorus concentration (n=4 excluding the extremely high measurement of 1.9mg/L on September 9th two days after ~5"of rain on the 7th was recorded at the Amherst rain station since it was considered atypical of normal conditions) was 0.036mg/L (maximum of 0.05mg/L). It should be noted that there is a City of Chicopee CSO (#42) located upstream of the sampling location which may have influence the extremely high total phosphorus concentration. There were no observations of dense or very dense filamentous algae noted.

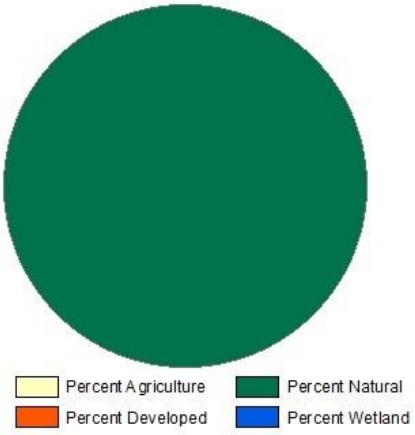
The Aquatic Life Use for this Unnamed Tributary locally known as "Willamansett Brook" is assessed as Fully Supporting based on the limited water quality monitoring data collected during the summer of 2008 that were indicative of good conditions although an Alert is being identified for the extremely high Total Phosphorus after the extreme wet weather event that may have activated the CSO.

Unnamed Tributary (MA34-65)

Location:	Unnamed tributary to Bachelor Brook, headwaters east of Route 116, Granby to mouth at confluence with Bachelor Brook, Granby.
AU Type:	RIVER
AU Size:	1.5 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA34-65

Watershed Area: 0.99 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.99	0.99	0.25	0.25
Agriculture	0%	0%	0%	0%
Developed	0.7%	0.67%	1.16%	1.16%
Natural	98.5%	98.47%	98.33%	98.33%
Wetland	0.9%	0.86%	0.52%	0.52%
Impervious Cover	0.05%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists this Unnamed Tributary AU (MA34-65) as a CFR and it is designated Cold-Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in this unnamed tributary just upstream of Bachelor Rd, Granby in July 2007 (SampleID 2125) and again in September 2013 (SampleID 4727). The sample was comprised entirely of multiple age classes of Eastern brook trout in 2007 and they dominated the sample in 2013 although pumpkinseed were the second most common fish in that sample.

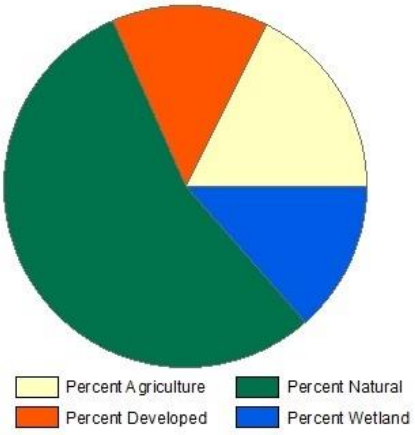
The Aquatic Life Use this Unnamed Tributary AU (MA34-65) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout which are indicative of excellent habitat and water quality conditions.

Unnamed Tributary (MA34-73)

Location:	Unnamed tributary from the south to the western bank of Hop Brook, from perennial portion south of Bay Road, Amherst to mouth at confluence with Hop Brook, Amherst.
AU Type:	RIVER
AU Size:	2 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA34-73

Watershed Area: 2.12 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.12	2.12	0.36	0.36
Agriculture	17.6%	17.61%	27.64%	27.64%
Developed	14%	14.03%	12.31%	12.31%
Natural	54.8%	54.85%	32.86%	32.86%
Wetland	13.5%	13.51%	27.18%	27.18%
Impervious Cover	3.53%			

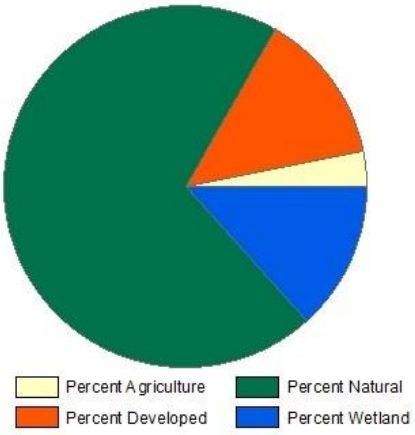
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG lists the unnamed tributary (MA34-73) as a CFR and it designated Cold-Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in the upper reach of this Unnamed Tributary to Hop Brook upstream of Bay Rd, Amherst in August 2008 (SampleID 2741). The sample was comprised of multiple age classes of Eastern brook trout and slimy sculpin. The Aquatic Life Use of the Unnamed Tributary AU (MA34-73) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout and slimy sculpin which are indicative of excellent habitat and water quality conditions.

Unnamed Tributary (MA34-74)

Location:	Unnamed tributary from the north to the eastern bank of Hop Brook, from just north of Route 9, Belchertown to mouth at confluence with Hop Brook, Amherst.
AU Type:	RIVER
AU Size:	2.7 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA34-74

Watershed Area: 3.33 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	3.33	3.33	0.62	0.62
Agriculture	3.1%	3.15%	0.89%	0.89%
Developed	13.6%	13.6%	6.8%	6.8%
Natural	70%	69.99%	65.68%	65.68%
Wetland	13.3%	13.27%	26.63%	26.63%
Impervious Cover	4.64%			

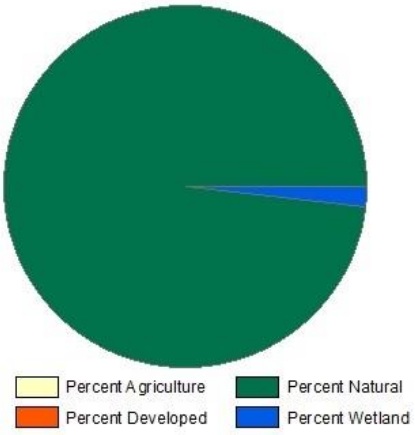
Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG lists the unnamed tributary (MA34-74) as a CFR and it is designated Cold-Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in this Unnamed Tributary to Hop Brook at Warren Wright Rd across from the bike path, Belchertown in August 2008 (SampleID 2743). The sample was dominated by fluvial fish including multiple age classes of Eastern brook trout. The Aquatic Life Use of the Unnamed Tributary AU (MA34-74) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout which are indicative of excellent habitat and water quality conditions.

Unnamed Tributary (MA34-77)

Location:	Unnamed tributary to outlet end of "old" Northampton Reservoir, perennial portion east of Hemenway Trail, Williamsburg to mouth at confluence with outlet end of "old" Northampton Reservoir, Whately.
AU Type:	RIVER
AU Size:	1.8 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

Unnamed Tributary - MA34-77

Watershed Area: 1.69 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.69	1.69	0.32	0.32
Agriculture	0%	0%	0%	0%
Developed	0%	0%	0%	0%
Natural	98.2%	98.19%	97.12%	97.12%
Wetland	1.8%	1.81%	2.88%	2.88%
Impervious Cover	0.69%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

This Unnamed Tributary is designated Cold-Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in this Unnamed Tributary AU (MA34-77) just downstream of the Whately town line in July 2007 (SampleID 2113). The sample was comprised of fluvial specialist species including multiple age classes of Eastern brook trout.

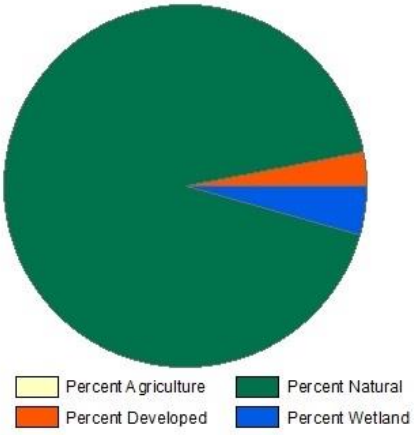
The Aquatic Life Use of this Unnamed Tributary AU (MA34-77) is assessed as Fully Supporting based on the presence of fluvial species including multiple age classes of Eastern brook trout which are indicative of excellent habitat and water quality conditions.

Unnamed Tributary (MA34-87)

Location:	Unnamed tributary to Sawmilll River, headwaters east of Montague Road, Shutesbury to mouth at confluence with Sawmill River, Leverett.
AU Type:	RIVER
AU Size:	1.9 MILES
Classification/Qualifier:	B

Unnamed Tributary - MA34-87

Watershed Area: 2.77 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.77	2.77	0.48	0.48
Agriculture	0.6%	0.61%	1.38%	1.38%
Developed	3%	2.99%	6.39%	6.39%
Natural	92.1%	92.09%	82.75%	82.75%
Wetland	4.3%	4.3%	9.48%	9.48%
Impervious Cover	1.31%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

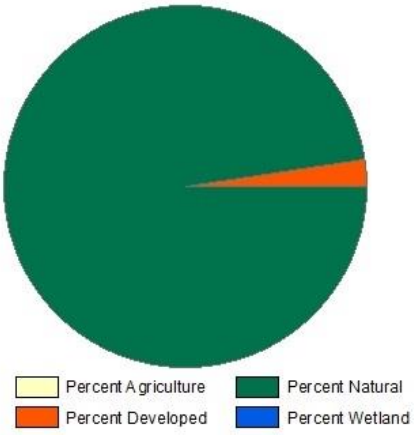
This Unnamed Tributary is designated Cold-Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in this Unnamed Tributary to the Sawmilll River (MA34-87) along Dudleyville Rd in August 2013 (SampleID 4992). The sample was comprised of multiple age classes of Eastern brook trout. The Aquatic Life Use of this Unnamed Tributary to the Sawmill River AU (MA34-87) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout which is indicative of excellent habitat and water quality conditions.

Unnamed Tributary (MA34-93)

Location:	Unnamed tributary to Hawley Reservoir, headwaters north of Tower Road in Cadwell Memorial Forest, Pelham to mouth at inlet Hawley Reservoir, Pelham.
AU Type:	RIVER
AU Size:	1 MILES
Classification/Qualifier:	A: PWS, ORW (Tributary)

Unnamed Tributary - MA34-93

Watershed Area: 0.72 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	0.72	0.72	0.18	0.18
Agriculture	0.9%	0.93%	0.94%	0.94%
Developed	2.4%	2.42%	5.3%	5.3%
Natural	95.7%	95.71%	93.12%	93.12%
Wetland	0.9%	0.94%	0.64%	0.64%
Impervious Cover	2.15%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting
MassDFG biologists conducted backpack electrofishing this Unnamed Tributary AU (MA34-93), upstream of east side Hawley Reservoir, Pelham in August 2008 (Sample ID 2738). The sample was comprised of multiple age classes of Eastern brook trout. The Aquatic Life Use of this Unnamed Tributary to the Hawley Reservoir AU (MA34-93) is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout which is indicative of excellent habitat and water quality conditions

Upper Highland Lake (MA34093)

Location:	Goshen.
AU Type:	FRESHWATER LAKE
AU Size:	51 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Upper Highland Lake, so it is Not Assessed.

Upper Van Horn Park Pond (MA34128)

Location:	Springfield (formerly reported as 2000 segment: Upper Van Horn Park Pond MA36158).
AU Type:	FRESHWATER LAKE
AU Size:	8 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use of Upper Van Horn Park Pond, so it is Not Assessed.

Venture Pond (MA34096)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	7 ACRES
Classification/Qualifier:	B

Fish, other Aquatic Life and Wildlife Use: Not Supporting
No new data are available for Venture Pond. The Aquatic Life Use of Venture Pond will continue to be assessed as Not Supporting with the dissolved oxygen, nutrient/eutrophication biological indicators and total phosphorus impairments being carried forward.

Watershops Pond (MA34099)

Location:	Springfield.
AU Type:	FRESHWATER LAKE
AU Size:	161 ACRES
Classification/Qualifier:	B

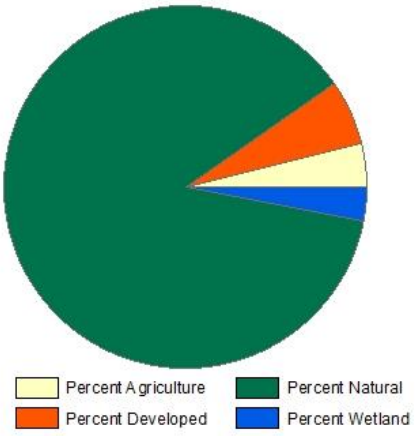
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for Watershops Pond, so it is Not Assessed.

West Branch Mill River (MA34-38)

Location:	East Street, Goshen to the confluence of Meekin Brook, Williamsburg.
AU Type:	RIVER
AU Size:	5.9 MILES
Classification/Qualifier:	B: CWF

West Branch Mill River - MA34-38

Watershed Area: 10.25 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	10.25	4.86	2.26	1.11
Agriculture	3.8%	5.7%	4.1%	6.4%
Developed	5.8%	7.7%	8.2%	10.2%
Natural	87.4%	83.3%	81.2%	75.6%
Wetland	3%	3.3%	6.5%	7.7%
Impervious Cover	2.7%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing 10 times in the this West Branch Mill River AU (MA34-38) between August and September 2006 through 2013. The most upstream sample was collected in the upper half of the AU at the first bridge on Hull Rd, off East St, Goshen (Sample ID 2942). The remaining nine samples were collected in the lower half of the AU downstream of the Graham Pond dam/Searsville dam, just upstream of Village Hill Rd, Williamsburg (Sample IDs 2479, 2950, 3607, 4636, 2077, 4095, 3217, 1806 & 2454). The samples were all dominated by fluvial specialist and depenant species with multiple age classes of Eastern brook trout and slimy sculpin present.

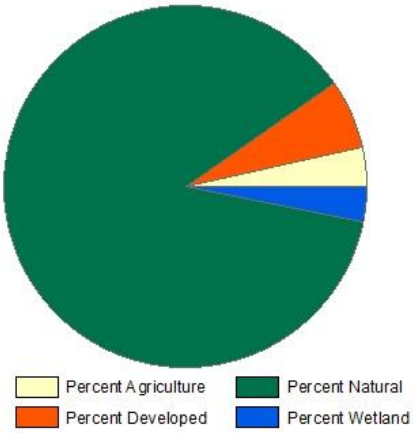
The Aquatic Life Use of this West Branch Mill River AU (MA34-38) is assessed as Fully Supporting based on the presence of fluvial fish including multiple age classes of Eastern brook trout and slimy sculpin and other salmonid species which is indicative of excellent habitat and water quality conditions.

West Branch Mill River (MA34-39)

Location:	From the confluence of Meekin Brook, Williamsburg to mouth at confluence with East Branch Mill River (forming headwaters Mill River), Williamsburg.
AU Type:	RIVER
AU Size:	0.6 MILES
Classification/Qualifier:	B

West Branch Mill River - MA34-39

Watershed Area: 12.76 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	12.75	6.30	2.78	1.51
Agriculture	3.5%	4.7%	3.9%	5.4%
Developed	6.1%	7.1%	9.2%	11.3%
Natural	87.4%	84.5%	81.2%	77.4%
Wetland	3.1%	3.7%	5.8%	6%
Impervious Cover	2.8%			

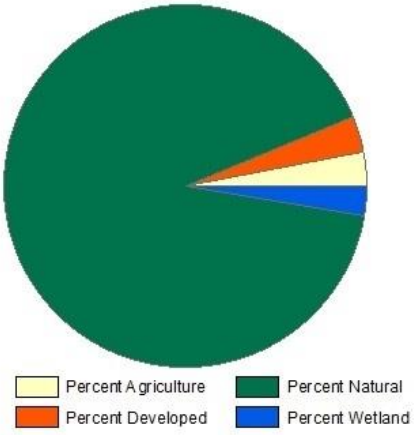
Fish, other Aquatic Life and Wildlife Use: Not Assessed
No data are available to assess the Aquatic Life Use for this West Branch Mill River AU (MA34-39) so it is Not Assessed.

WEST BROOK (MA34-58)

Location:	Headwaters, outlet Northampton Reservoir (Old Northampton Reservoir), Whately to mouth at confluence with Mill River, Hatfield.
AU Type:	RIVER
AU Size:	4 MILES
Classification/Qualifier:	B: CWF

WEST BROOK - MA34-58

Watershed Area: 10.75 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	10.75	3.38	2.36	1.02
Agriculture	3%	5.77%	2.19%	3.91%
Developed	3.3%	8.85%	5.82%	10.68%
Natural	91.2%	82.31%	87.09%	78.98%
Wetland	2.6%	3.07%	4.9%	6.42%
Impervious Cover	1.59%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in West Brook off Conway Rd, about a half mile east of Webber Rd, Whately in September 2011 (SampleID 3681). The sample was comprised of fluvial species including multiple age classes of Eastern brook trout.

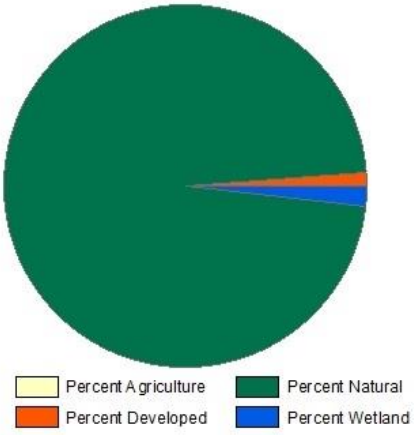
The Aquatic Life Use of West Brook is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout which is indicative of excellent habitat and water quality conditions.

WEST WAIT BROOK (MA34-89)

Location:	Headwaters, perennial portion, west of Old Vernon Road, Northfield to the confluence of East Wait Brook, Northfield.
AU Type:	RIVER
AU Size:	1.7 MILES
Classification/Qualifier:	B

WEST WAIT BROOK - MA34-89

Watershed Area: 1.35 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.35	1.35	0.38	0.38
Agriculture	0%	0%	0%	0%
Developed	1.2%	1.18%	3.82%	3.82%
Natural	97.1%	97.06%	93.8%	93.8%
Wetland	1.8%	1.76%	2.38%	2.38%
Impervious Cover	0.15%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG does list West Wait Brook as a CFR and it is designated Cold-Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in West Wait Brook at the Satans Kingdom Entrance Road in Northfield in July 2006 (SampleID 1591). The sample was comprised of multiple age classes of Eastern brook trout and slimy sculpin.

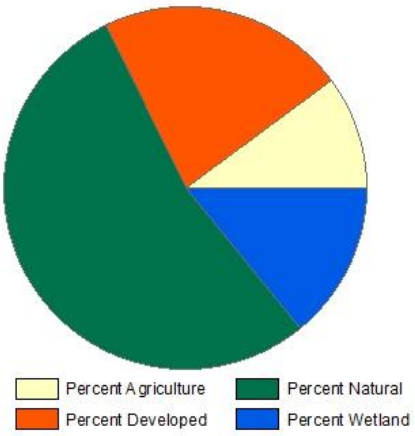
The Aquatic Life Use of West Wait Brook is assessed as Fully Supporting based on the presence of multiple age classes of Eastern brook trout and slimy sculpin.

Weston Brook (MA34-23)

Location:	Headwaters, south of State Street (Route 202), Belchertown to mouth at inlet Forge Pond, Granby (WWF applies from the confluence of Lampson Brook in Belchertown to the mouth).
AU Type:	RIVER
AU Size:	2.7 MILES
Classification/Qualifier:	B: WWF* (a portion of Weston Brook is included in a 2007 SWQS entry and designated "B WWF")

Weston Brook - MA34-23

Watershed Area: 4.09 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	4.09	4.09	1.07	1.07
Agriculture	10.1%	10.1%	11.1%	11.1%
Developed	22.1%	22.1%	14.1%	14.1%
Natural	53.8%	53.8%	48.9%	48.9%
Wetland	14%	14%	25.9%	25.9%
Impervious Cover	7.2%			

Fish, other Aquatic Life and Wildlife Use: Not Supporting

MassDEP biologists conducted benthic sampling in Weston Brook immediately upstream of Boardman Street, Belchertown (B0637) in July 2008 (the downstream reach of this Weston Brook AU). The RBPIII analysis indicated the sample was "Non-Impaired", 95% comparable to the Amethyst Brook reference station (B0514). MassDEP biologists also conducted backpack electrofishing in the brook downstream of Boardman Rd in Belchertown (Sample ID 4497) in September 2008. Depsite poor sampling efficiency four fluvial species including multiple age classes of Eastern brook trout (noted as appearing wild) were collected. MassDEP staff also conducted water quality monitoring in the brook at Boardman Street (W1791) during the summer of 2008. The minimum DO of 5.14mg/L was measured during five-day probe deployments in May, June, July and September (mean minimum DO concentrations ranged from 5.36 to 7.14mg/L during these deploys), the maximum saturation was 98.1%, the maximum diel shift was 2.25mg/L, and the maximum temperature was 22.9°C. Discrete pH measurements ranged from 6.4 to 7.1SU (n=7), and the seasonal average total phosphorus concentration (n=5) was 0.079 mg/L (maximum 0.093 mg/L). There was one observation of dense or very dense filamentous algae noted.
Despite evidence of good biological condition (non-impacted benthic community and presence of fluvial fish species including multiple age classes of Eastern brook trout), the Aquatic Life Use of Weston Brook will continue to be assessed as Not Supporting with the total phosphorus impairment being carried forward. It is noted that while total phosphorus concentrations are much lower than those documented during the 1986 surveys when the mean concentration near Forge Pond was 0.210mg/L (maximum 0.400mg/L), the seasonal average concentration

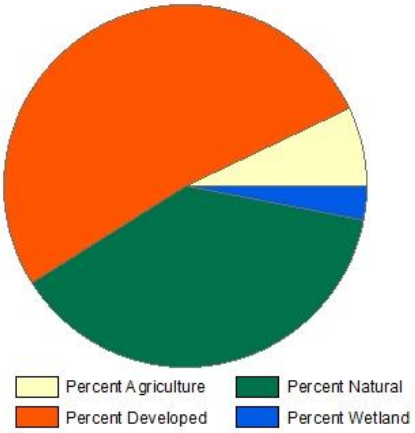
documented during the summer of 2008 was 0.079 mg/L (still slightly higher than the recommended concentration of 0.05mg/L recommended for a river entering a lake (in this case Forge Pond)).

White Brook (MA34-14)

Location:	Headwaters, perennial portion, Easthampton to mouth at inlet Nashawannuck Pond, Easthampton.
AU Type:	RIVER
AU Size:	1.8 MILES
Classification/Qualifier:	B

White Brook - MA34-14

Watershed Area: 2.36 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	2.36	2.36	0.35	0.35
Agriculture	7%	7%	7.4%	7.4%
Developed	52%	52%	34.1%	34.1%
Natural	38.1%	38.1%	49.6%	49.6%
Wetland	3%	3%	9%	9%
Impervious Cover	13.9%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG biologists conducted backpack electrofishing in White Brook near Button Rd crossing, just south of White Brook Middle School, Easthampton in August 2010 (SampleID 3519). Two fluvial specialist species in high abundance were collected in this low gradient stream.

The Aquatic Life Use of White Brook is assessed as Fully Supporting based on the presence of fluvial specialist species in this low gradient stream.

Whiting Street Reservoir (MA34101)

Location:	Holyoke.
AU Type:	FRESHWATER LAKE
AU Size:	102 ACRES
Classification/Qualifier:	A: PWS, ORW

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
4c	4c	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

An infestation of the non-native aquatic macrophyte, *Myriophyllum spicatum* (Eurasian Water Milfoil) was observed in Whiting Street Reservoir during the MassDEP 1998 synoptic survey. Additionally, a record of *Trapa natans* (Water Chestnut) was noted in the Whiting Street Reservoir in 2013, according to the USGS Nonindigenous Aquatic Species website.

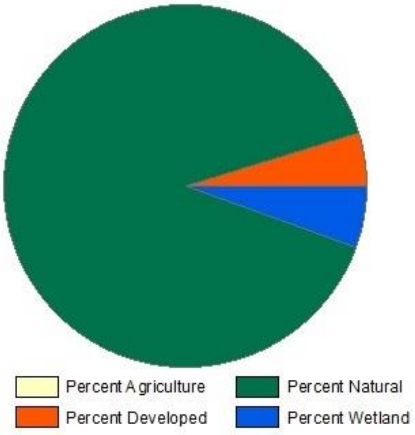
The Aquatic Life Use of Whiting Street Reservoir will continue to be assessed as Not Supporting due to the presence of Eurasian Water Milfoil and an impairment for Water Chestnut (*Trapa natans*) will be added.

WILLIAMS BROOK (MA34-86)

Location:	Headwaters, perennial portion, south of Chestnut Hill Loop, Montague to mouth at confluence with Sawmill River, Leverett.
AU Type:	RIVER
AU Size:	1.5 MILES
Classification/Qualifier:	B

WILLIAMS BROOK - MA34-86

Watershed Area: 1.38 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.38	1.38	0.49	0.49
Agriculture	0.4%	0.4%	0.97%	0.97%
Developed	4.7%	4.68%	6.25%	6.25%
Natural	89.5%	89.47%	80.13%	80.13%
Wetland	5.5%	5.46%	12.66%	12.66%
Impervious Cover	1.71%			

Fish, other Aquatic Life and Wildlife Use: Fully Supporting

MassDFG lists Williams Brook as a CFR and it was designated as Cold Water in the proposed SWQS. MassDFG biologists conducted backpack electrofishing in Willimas Brook just upstream of North Leverett Rd, Leverett in August 2006 (SampleID 1513). The sample was comprised entirely with fluvial species including multiple age classes of Eastern brook trout.

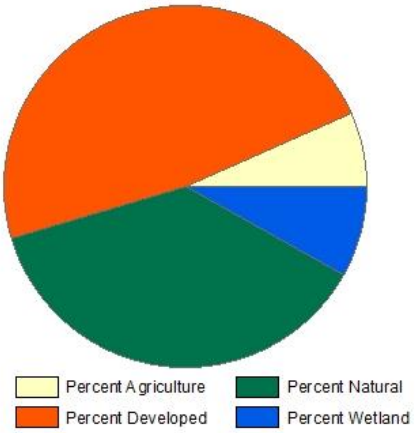
The Aquatic Life Use of Williams Brook (MA34-86) is assessed as Fully Supporting based on the presence of fluvial species including multiple age classes of Eastern brook trout which is indicative of excellent habitat and water quality conditions.

Wilton Brook (MA34-15)

Location:	Headwaters, perennial portion, Easthampton to outlet RubberThread Pond, Easthampton (through former 2006 segment: RubberThread Pond MA34105).
AU Type:	RIVER
AU Size:	1.1 MILES
Classification/Qualifier:	B

Wilton Brook - MA34-15

Watershed Area: 1.25 square miles



Landuse Type	Entire Basin	5km Radius Proximal Subbasin	100m Stream Buffer	Proximal Stream Buffer
Land Use Area (square miles)	1.25	1.25	0.26	0.26
Agriculture	6.6%	6.6%	1.1%	1.1%
Developed	48%	48%	41.2%	41.2%
Natural	37.3%	37.3%	39.9%	39.9%
Wetland	8.1%	8.1%	17.8%	17.8%
Impervious Cover	16.6%			

2016 AU Category	2018/20 AU Category	Impairment	ATTAINS Action ID	Impairment Change Summary
5	5	(Non-Native Aquatic Plants*)		Removed
5	5	(Water Chestnut*)		Added

Fish, other Aquatic Life and Wildlife Use: Not Supporting

An infestation of *Trapa natans* (Water Chestnut) was observed in the Rubber Thread Pond impoundment of Wilton Brook by Silvio O. Conte National Fish and Wildlife Refuge staff. MassDFG biologists conducted backpack electrofishing in Wilton Brook at South St crossing in Easthampton in September 2009 (SampleID 3151) further downstream at Greenwood Ct, Easthampton in September 2009 (Sample ID 3152). Both samples were dominated by fluvial species though moderately tolerant macrohabitat generalist species were also present. The Aquatic Life Use of Wilton Brook will continue to be assessed as Not Supporting. The generic Non-Native Aquatic Plants impairment is being removed and the specific non-native aquatic macrophyte "Water Chestnut" impairment is being added.

2018/20 Delisted Impairment	Delisting Reason	Delisting Comment
Non-Native Aquatic Plants	Clarification of listing cause	Impairment changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

Supporting Information for Delisted Impairments

Non-Native Aquatic Plants

There are infestations of the non-native aquatic macrophyte, *Trapa natans*, in Rubber Thread Pond (part of this A.U.) (Boettner, RE: Location of water chestnut infestations in the CT watershed 2007). The impairment was changed from the generic "Non-Native Aquatic Plants" to the specific macrophyte "Water Chestnut".

References

Boettner, C. "RE: Location of water chestnut infestations in the CT watershed." Email to Laurie Kennedy (MassDEP Division of Watershed Management) dated November 16, 2007, Silvio O. Conte National Fish and Wildlife Refuge, United States Fish and Wildlife Service, Sunderland, Massachusetts, 2007.

Boettner, C. "RE: Location of water chestnut infestations in the CT watershed." Email to Laurie Kennedy (MassDEP Division of Watershed Management) dated November 16, 2007, Silvio O. Conte National Fish and Wildlife Refuge, United States Fish and Wildlife Service, Sunderland, Massachusetts, 2007.

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MassDEP. "2015 Scanned Project Files, Connecticut Watershed Lake Survey Data 1998 pdf file D01-15." Division of Watershed Management, Massahcusetts Department of Environmental Protection, Worcester, Massachusetts, 1998.

MassDEP. "Freshwater Aquatic Invasive Species Database Open Project Files." Division of Watershed Management, Massachusetts Department of Environmental Protection, Worcester, Massachusetts, Undated.

MassDEP. *Herbicide Database, as of January 2017.* Database. Prod. Division of Watershed Management Massachusetts Department of Environmental Protection. Worcester, Massachusetts, 2017.

MassDEP. "Integrated Listing History 1992-2014 INTLIST_HISTORY.xlsx." Division of Watershed Management, Massachusetts Department of Environmental Protection, Worcester, Massachusetts, 2015.

MassDEP. "Open file analysis of DWM WPP water quality data collected between 2000 and 2014 using CALM guidance." Division of Watershed Management, Massachusetts Department of Environmental Protection, Worcester, Massachusetts, Undated.

MassDEP. "Open files of unpublished, validated water quality monitoring data, field sheet data, and GIS datalayers in development." Division of Watershed Management, Massachusetts Department of Environmental Protection, Worcester, Massachusetts, Undated.