Deerfield River Volunteer Monitoring Program

2002 Final Report

Marie-Françoise Walk

November 11, 2002

Deerfield River Volunteer 2002 Monitoring Final Report

Acknowledgments

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Anne Larsen, Shelburne
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Catherine Reid, Shelburne Falls
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John Whitman, Readsboro, VT

Introduction

The Deerfield River Watershed Association (DRWA) has been monitoring the water quality of the Deerfield River and several tributaries in Massachusetts since 1990, as part of its mission to improve and protect water quality throughout the basin.

In 1998 we changed our focus somewhat, reducing the monitoring of chemical data (pH, alkalinity, and dissolved oxygen) to only once or twice a year (April and sometimes September), but adding a new parameter: Fecal coliform bacteria to assess whether the river supports Massachusetts water quality standards for primary and secondary contact recreation.

After three years of relying on outside laboratories for bacterial analysis, we decided to establish our own laboratory to have better control on quality control as well as to have the flexibility of sampling whenever we wanted. This was accomplished in 2001 and the lab has been used for DRWA analyses since April 2001.

The 2002 DRWA water quality monitoring program had three goals:

- to build on our eleven-year baseline of data for chemical and physical parameters in order to document any changes in the water quality of the mainstem and major tributaries
- to assess popular swimming holes for primary and secondary contact recreation
- and to compare fecal coliform bacteria to E. coli analyses.

Methods

Funding from the Massachusetts Environmental Trust allowed for hiring a water quality monitoring program coordinator for the first time. Matthew Dodge was hired in February 2002, trained by MF Walk, and sent to the University of Massachusetts Environmental Laboratory's Chemical Analyses workshop in March where he learned how perform analyses for dissolved oxygen, pH, and alkalinity.

He contacted volunteer monitors and analysts from previous years and recruited a few new volunteers. New and returning volunteers made up a volunteer force of 21 people. Most were sample collectors, while two were lab analysts. Volunteers were given a training binder including site location sheets to find their sites, and were instructed to make corrections to those directions as needed. All volunteers were trained in sample collection methods by M.F. Walk, Project Leader, on April 7 2002. All collection methods follow the Massachusetts Water Watch Partnership protocols. Matthew Dodge resigned in May, so another coordinator, Marie Iken, was hired.

Twelve sites (see Table 1) were monitored for pH, alkalinity, water temperature, and dissolved oxygen in April. Ten of those sites have been monitored as part of the DRWA Water Quality program historically. Two more sites were added in Vermont in 2001. Ten sites were monitored in June, July, and August for water temperature and fecal coliform bacteria (see Table 1). Those sites were selected from a list of eleven sites chosen for their use as unofficial but popular swimming holes. Our lab capacity allows us to handle no more than 15 samples (10 field samples and 5 quality control samples), so we could not sample more than ten of the eleven sites simultaneously.

Samples were analyzed by DRWA volunteers and the Program Coordinator at the DRWA lab in Shelburne Falls. Those volunteers and their qualifications are:
Dr. Robert Walker, microbiologist
Denise Pavao, microbiologist (June only)
Marie Iken, Program Coordinator (July and August only)
Matt Dodge, Program Coordinator (April only)

All analyses followed Standard Methods (APHA, 1995). New this year was an air incubator which was used for fecal coliform analyses. In-house tests showed that it held incubating temperature within 0.2°C for the 24 hour incubation period.

On April 21, between 7 and 10 A.M., the monitors visited 12 sites (see Table 1) and samples were brought to the DRWA Lab for the analysis of dissolved oxygen (DO), pH, and alkalinity. A field duplicate was taken by one team of monitors. One team of monitors was observed by M.F. Walk for quality control (QC) purposes. QC samples (blind samples) were obtained from the UMass Environmental Analysis Lab (EAL).

June 9 and 23, July 14 and 28, and August 1 and 15, ten sites were visited and sampled for fecal coliform bacteria. Samples were collected between 10 A.M. and 1 P.M. One team of monitors was observed by M.F. Walk on June 9 for quality control (QC) purposes. A field duplicate, field blank, lab duplicate and lab blank were to be run as well as a positive sample collected from the Green River at a site historically known for bacteria pollution (Mead Street in Greenfield).

Another goal was to begin analyzing river samples for E. coli, as the state of Massachusetts Department of Environmental Protection is likely to change its water quality standards to use E. coli instead of Fecal Coliforms (FC) for recreation standards. The plan was to pick a few samples every collection and analyze them for both fecal coliforms and E. coli. However, that proved to be too much to ask of the volunteer analysts and our new staff, as they were getting used to working together. Therefore, Marie Iken and Marie-Françoise Walk, helped by a couple of sampling volunteers, collected a few river samples in September and ran both FC and E. coli analyses on those. Five samples were analyzed on September 18, and 4 on September 26, 2002. The FC plates were incubated in the air incubator at 44.5 +/- 0.2°
C as usual, and the E. coli plates were incubated in our old water bath incubator at 35 +/- 0.5°C).

Table 1: Deerfield River 2002 Monitoring Sites (see appendix for site location descriptions)

Site Number	Site Name	Town	Samplers	Parameters
COR-010	Cold River	Charlemont	Wales/Allman	pH ANC DO Bacteria
DER-010	Rtes 5&10 Bridge	Deerfield	Jacque	pH ANC DO
DER-012	Deerfield Academy	Deerfield	Sabos	Bacteria
DER-014	South River Confluence	Conway	Healey	Bacteria
DER-015	Stillwater	Deerfield	May	pH ANC DO Bacteria
DER-016	Gardner Falls	Buckland	Gorecki/Reid	pH ANC DO
DER-018	Potholes	Shelburne Falls	Anderson/Marmaras	Bacteria
DER-019	Wilcox Hollow	Shelburne	Crawford/Benjamin	Bacteria
DER-020	Old Willow	Charlemont	Crawford/Benjamin	pH ANC DO
DER-021	Below Charlemont WWTP	Charlemont	Wales/Allman	pH ANC DO
DER-025	Deerfield River, Zoar Gap	Charlemont	Reid/Gorecki	pH ANC DO Bacteria
DER-100	Deerfield River Main Branch	Readsboro	Whitman	pH ANC DO
GRR-030	Green River Covered Bridge	Greenfield	Maynard	Bacteria
JGW-001	West Branch Swimming Hole	Readsboro	Whitman	Bacteria
NOR-002	Sunburn Beach	Colrain	Larsen	Bacteria
NOR-010	Above Veratec	Colrain	Slowinski	pH ANC DO Bacteria
NOR-015	Below Veratec	Colrain	Larsen	pH ANC DO
SOR	South River	Conway	Healey	pH ANC DO
WER-050	West Branch Deerfield River	Readsboro	Whitman	pH ANC DO

Quality Control

Quality control data for the whole monitoring season can be found in the Appendix.

Thermometers were calibrated against an NIST certified thermometer at EAL in April and were found 100% reliable (measured temperatures within 0.5 °C of the standard thermometer) and were thus distributed to volunteers.

Two field check were performed by MF Walk on volunteer teams to ensure they followed proper sampling procedures. No problems were detected.

In April, the lab passed the MassWWP quality control samples for pH, alkalinity, and dissolved oxygen, except for one alkalinity blind sample. Duplicates passed a 10% precision objective except again for one alkalinity field duplicate. The river samples alkalinity data were not discarded, but a note is made here that they may be a little higher than usual due to pH meter problems.

Field duplicates and lab duplicates (except one on June 9) passed our data quality objectives for bacteria analyses. Field blanks and lab blanks (when analyzed, which didn't happen in June) always came out blank. Positive samples came out positive. No river data was discarded, as only one QC test out of 27 was failed, and even then 3 colonies vs 16 colonies is a minor discrepancy when one realizes that fecal coliforms are living organisms and a variable measurement. Furthermore our objective is to compare data to 400 colonies/100ml, so that 3 vs 16 colonies would make no difference in our data interpretation.

Results

Table 2: Results for the April 21, 2002 Collection

Date Sampled: 4/21/02					
Site Code	**Site Name**	**pH**	**Alkalinity***	**DO**	**DO saturation**
			(mg/l)	**(mg/l)**	**(%)**
COR-010	Cold River	5.59	5.80	10.06	87
DER-010	Deerfield R, 5&10	6.35	15.50	8.96	83
DER-015	Stillwater	6.70	9.70	10.44	95
DER-016	Gardner Falls	6.34	10.30	10.54	93
DER-020	Below S.F. WWTP	6.39	8.10	10.84	94
DER-021	Above S.F. WWTP	6.46	9.20	11.20	92
DER-025	Zoar Gap	6.20	4.40	10.64	92
DER-100	Main Branch Readsboro	6.02	6.50	11.46	92
NOR-010	North R, below Veratec	6.84	19.70	10.96	95
NOR-015	North R, above Veratec	6.83	21.10	10.48	93
SOR	South River	6.90	32.70	13.06	113
WBD-050	West Branch	5.92	2.70	10.50	89
fails MA WQ Standards *Alkalinity may be high due to probe malfunction					

Dissolved Oxygen levels were high as always and exceeded the Massachusetts Water Quality Standards for cold water fishery of 6 mg/l. Percent saturation values also put the water above the standard of 75%.

The site with lowest DO was Rte 5&10 bridge in Deerfield, with 8.96 mg/l and 83% saturation, which is a similar situation as in 2001. Again this year the river was flooded which prevented our collecting a sample in the true river bed. Rather, the sample was collected in somewhat quiet back waters.

pH values were generally lower than in the past, with 8 out of 12 sites failing Massachusetts water quality standards of 6.5-8.3. At this time it is not known whether that is a true trend or whether our pH electrode is responsible for the low measurements. Even though blind QC samples for pH were passed without problems, the fact that the alkalinity QC data showed some problems may be an indication that the probe was not working perfectly well. Alkalinity data looks normal for the sites, maybe a little higher than usual at Cold River and Zoar Gap. As always, alkalinity is under 20mg/l at most sites, which shows that our river system is sensitive to acidification.

Table 3: Bacteria Data, Summer 2002

Deerfield River Fecal Coliforms (Number of colonies per 100 ml)						
Site	**8-Jun-02**	**23-Jun-20**	**14-Jul-02**	**28-Jul-02**	**11-Aug-02**	**25-Aug-02**
Cold River	0	80	22	6	22	40
Deerfield Academy	54	LE	NS	25	17	22
South River Confluence	23	620	9	13	8	21
Stillwater	NS	740	NS	15	13	12
Potholes	39	>100	126	350	NS	NS
Wilcox Hollow	68	400	NS	50	59	65
Zoar Gap	7	10	5	6	3	6
Green River Covered Bridge	36	68	36	15	9	54
Sunburn Beach	31	192	32	116	60	49
North River above BBA	16	120	17	60	29	236
West Branch Deerfield River	3	17	15	NS	1	134
NS=Not Sampled LE=Lab Error						
Red: violates swimming standards						
orange: violates swimming and boating standards						

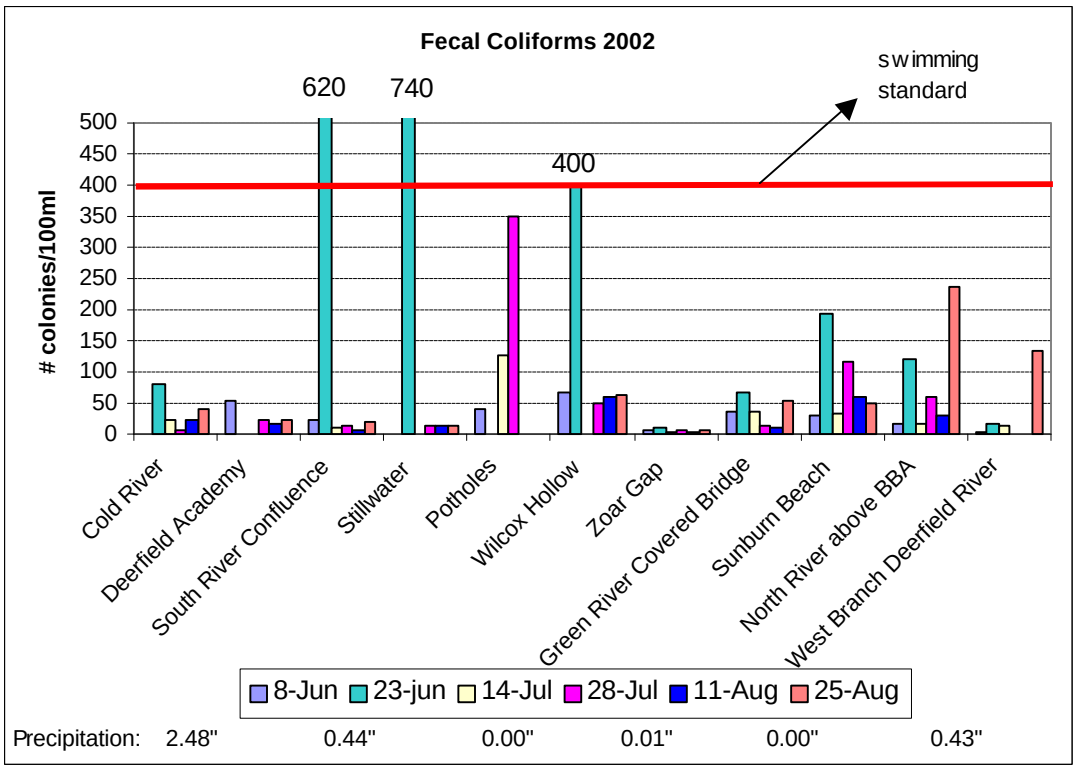

Figure 1: Fecal coliform bacteria, by site

Table 4: Precipitation at Greenfield Pollution Control Facility (7:30 A.M.)

Date	Precipitation (in)	Date	Precipitation (in)
6/6/02	1.42	7/26/02	0.00
6/7/02	1.04	7/27/02	0.01
6/8/02	0.02	7/28/02	0.00
6/21/02	0.00	8/9/02	0.00
6/23/02	0.00	8/10/02	0.00
6/23/02	0.44	8/11/02	0.00
7/12/02	0.00	8/23/02	0.26
7/13/02	0.00	8/24/02	0.00
7/14/02	0.00	8/25/02	0.17

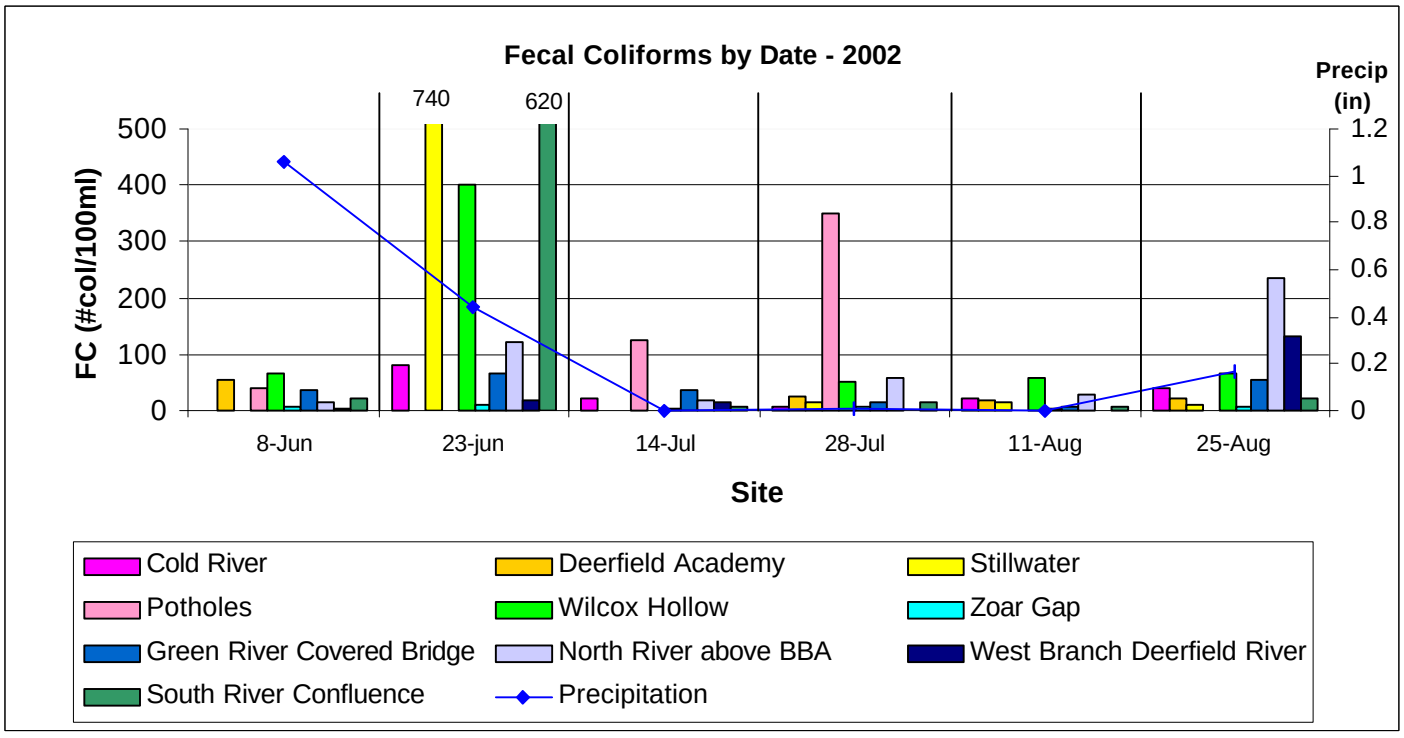

Figure 2: Fecal Coliform Data, by date

As can be seen in the table and figures above, bacteria counts are usually low at all sites in dry weather. One exception is the Potholes site in Shelburne Falls which had counts of 126 and 350 colonies per 100ml in July when no precipitation occurred. During or after a storm, several sites do exhibit elevated counts, even exceeding the Massachusetts water quality standards for primary contact recreation (400 colonies/100ml).

Those sites are the South River confluence, the North River above BBA, the Potholes, Wilcox Hollow, and Stillwater. This is a similar picture to last year's except that Stillwater never had high counts before while Sunburn Beach did in 2001. Sites that are consistently low in bacteria are the Cold River, Zoar Gap, the Green River at the covered bridge, and Deerfield Academy. We are starting to see a pattern of sites that are affected by runoff. Predicting what size storm triggers high bacteria counts at certain sites is a little less clear. The period of time before sampling which is affecting water quality when there is precipitation has not yet been determined. In Figure 2, the precipitation amount graphed is the sum of precipitation for the day of sampling and the day prior to sampling (as measured at the Greenfield Pollution Control Facility at 7:30 A.M. each day). To come up with a better independent variable, we would have to measure precipitation more accurately.

Results from the E. coli to Fecal Coliform comparison are found in Table 5 and Figure 3. The only generalization we can make at this point is that E. coli counts are always lower than FC counts. The relationship between the two does not appear linear or even very regular so far, but we only have 9 sets of points for the relationship.

Table 5: Fecal Coliform to E. coli comparison (number colonies/100ml)

Site	9/26/02		9/18/02	
	E. coli	FC	E. coli	FC
Mead Street	132	204	66	244
GRR-030	20	62	10	66
NOR-010			288	404
NOR-002			50	8
DER-018	127	157	32	96
DER-019	27	66		

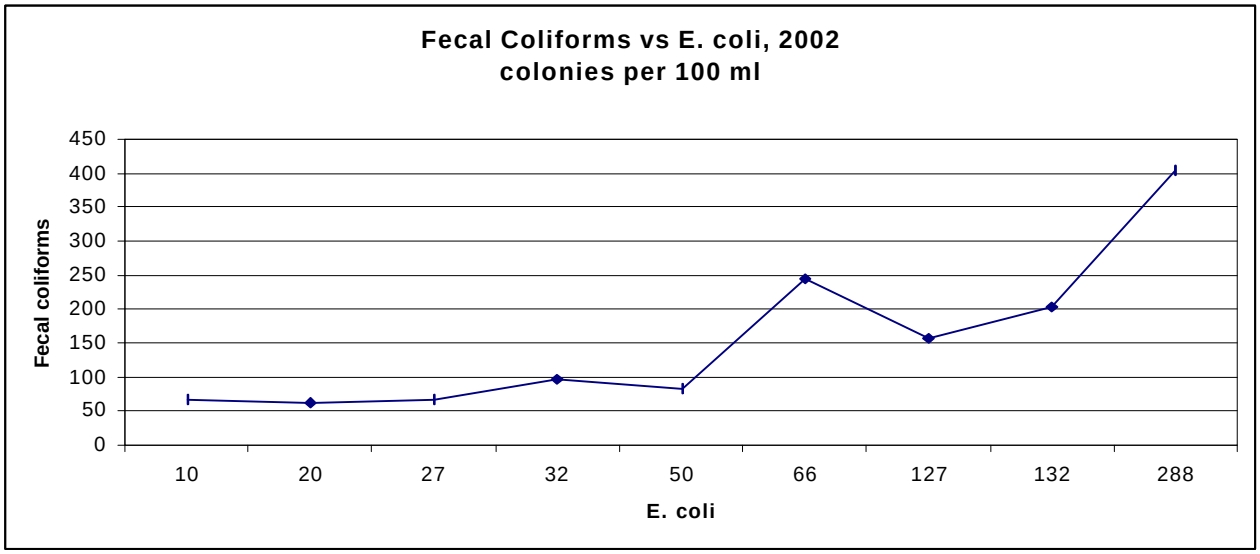

Figure 3: Fecal coliform and E. coli analyses comparison

Conclusions
Our data indicate that alkalinity levels are low in the watershed, especially in the headwaters. Low pH levels may stress our native trout fishery. Dissolved oxygen levels continue to be high and very adequate for a cold water fishery.

Our fifth year of bacteria data confirms that during dry spells the Deerfield River and the tributaries we monitor are free of bacteria and safe for contact recreation. After storm events, however, some sites become contaminated with enough bacteria to make them unsafe for swimming.

E. coli analyses proved to pose no problem and we should be able to switch to that parameter in the future, but more side-by-side comparisons will need to be made before we feel comfortable using both parameters in a single trend analysis.

Recommendations
Although five years of data begin to point to specific sites in the watershed that are affected by runoff, we should continue bacteria analyses to confirm our findings. It would also be advisable to start monitoring precipitation more precisely, that is have several rain gages in the watershed close to our sampling sites and have volunteers assigned to reading them frequently before and during sampling.

We also recommend continuing running simultaneous fecal coliforms and E. coli analyses in order to develop a better relationship between the two for our sites in the watershed.

Last year, a long-term goal and recommendation was to build up our volunteer corps in Vermont and ultimately establish a second laboratory in that state to allow expansion of sites there. This is still viewed as desirable, and might be better reached if a permanent coordinator staff position could be secured.

APPENDIX

Quality Control for April 21 2002, Accuracy and Precision

Accuracy	pH			ANC		DO
QC1	7.36			11.4		8.66
QC2	7.26			12.9		9.38
QCexp.	7.3			8.9		9.2
QCrange	7			5.9		8.28
QCrange	7.6			11.9		10.12
Pass/Fail	**P**			**P**		**P**
Pass/Fail	**P**			**F**		**P**

Precision	pH1	pH2	ANC1	ANC2	DO1	DO2
Field Duplicate	6.7	6.65	9.7	11	10.44	10.48
Lab Duplicate	6.9	6.63	32.9	32.7	10.78	10.84
FD RPD	0.2	**P**	12.56	**F**	0.38	**P**
LD RPD	0.27	**P**	0.61	**P**	0.56	**P**
	RPD should be < 0.3		RPD should be <10		RPD should be <10	

Quality Control for Bacteria Analyses Summer 2002

Date	FB	LB	Positive	FD		LD	
6/9/02	0	NA	TNTC	31	37	16	3
6/23/02	0	NA	272	740	LE	68	56
7/14/02	0	0	113	32	30	126	132
7/28/02	0	0	TNTC	15	14	380	320
8/11/02	0	0	35	13	13	13	14
8/25/02	0	0	TNTC	19	22	132	136

NA = Not Analyzed
TNTC = Too Numerous To Count
LE = Lab Error
Red = fails Quality Control Standards

SITE LOCATION SHEET

Site Name: Cold River

Site Number: COR-010

Town: Charlemont

Nearest major highway: Rte 2

Road names and/or numbers connecting major highway to the site access road:
Coming from Shelburne on Rte 2, follow road through Charlemont Center, toward Mohawk State Forest.
There is a pullout on the right hand side, before the State Forest.

Specific directions from access road (named above) to exact location of sampling site:
Park in pullout.
Walk over guard rail, there is a trail that veers to the right, down to the river.
Follow trail. You'll see old pipes standing.
Take sample at bottom of trail.

SITE LOCATION SHEET

Site Name: Deerfield River -5&10 Bridge

Site Number: DER-010

Town: Deerfield

Nearest major highway: Rtes 5&10

Road names and/or numbers connecting major highway to the site access road:
From Deerfield, follow Rtes 5&10 north to Greenfield.
Just before bridge over Deerfield River, park on River Rd. on right.

Specific directions from access road (named above) to exact location of sampling site:
Cross River Rd., go over guard rail, walk down to river on worn path.
Walk under bridge, keep walking about 100 yards.
Take sample by large flat rocks.

SITE LOCATION SHEET

Site Name: Deerfield Academy

Site Number: DER-012

Town: Deerfield

Nearest major highway: Rtes 5 &10

Road names and/or numbers connecting major highway to the site access road:
From Greenfield, travel south on Rtes 5& 10.
Take right into Historic Deerfield.
Bear left into center of Historic Deerfield.
Pass Deerfield Inn, take a right onto Albany Rd.
Go to the end of Albany Rd.
Park by cemetery.

Specific directions from access road (named above) to exact location of sampling site:
Walk across playing fields (downhill and bear right).
Once you get to the edge of the woods, you will see a path and an opening to the river.
Take sample at river bank.

SITE LOCATION SHEET

Site Name: South River Confluence

Site Number: DER-014

Town: Conway

Nearest major highway: Rte 116

Road names and/or numbers connecting major highway to the site access road:
From Rte 116 in Conway, take Shelburne Falls Rd.
Take a right onto Bardswell Ferry Rd.
Take a right on Reeds Bridge Rd onto Bardswell Ferry Road and travel 0.8 miles to a right (dirt road).
Follow all the way to end.

Specific directions from access road (named above) to exact location of sampling site:
Look for steps going down to the river.
Take sample in the mix of the Deerfield and South Rivers

SITE LOCATION SHEET

Site Name: Deerfield River - Stillwater

Site Number: DER-015

Town: Deerfield

Nearest major highway: Rte 116

Road names and/or numbers connecting major highway to the site access road:
From Conway, travel south on Rte 116.
Near “Mill River” turn left onto Lee Rd.
Then turn left onto West Road.
Stop and park at intersection with Upper Rd (just before bridge above Deerfield River)

Specific directions from access road (named above) to exact location of sampling site:
Follow path from parking area to river, where you will take sample.

SITE LOCATION SHEET

Site Name: Deerfield River, Below Shelburne WWTP: Gardner Falls

Site Number: DER-016

Town: Buckland

Nearest major highway: Rte 2

Road names and/or numbers connecting major highway to the site access road:
From Rte 2 in Shelburne, take left at Sweetheart Restaurant (S. Maple St)**.**
Cross iron bridge and take left onto Conway Rd.
Take road on left to Gardner Falls hydroelectric station

Specific directions from access road (named above) to exact location of sampling site:
Take sample above dam.

SITE LOCATION SHEET

Site Name: Potholes

Site Number: DER-018

Town: Shelburne Falls

Nearest major highway: Rte 2

Road names and/or numbers connecting major highway to the site access road:
Traveling west from Greenfield on Rte 2, take a left at the Sweetheart Restaurant onto South Maple St.
Take a left onto Deerfield Rd (toward potholes)
Park at Mole Hollow Candles

Specific directions from access road (named above) to exact location of sampling site:
Walk down stairs.
Walk down through rocks where there is flow

SITE LOCATION SHEET

Site Name: Wilcox Hollow

Site Number: DER-019

Town: Shelburne

Nearest major highway: Rte 2

Road names and/or numbers connecting major highway to the site access road:
Traveling east on Rte 2 from Shelburne Falls, look for Wilcox Hollow sign on right past the State Police barracks. It is directly across the street from a road (blue Kingdom Hall mailbox).

Specific directions from access road (named above) to exact location of sampling site:
Drive all the way to end of dirt road. Park.
Walk to river's edge along "boat access".

SITE LOCATION SHEET

Site Name: Deerfield River, Old Willow

Site Number: DER-020

Town: Charlemont

Nearest major highway: Rte 2

Road names and/or numbers connecting major highway to the site access road:
Travel west on Rte 2 from Shelburne**.**
Pass Stillwater Restaurant. There is a large pullout on the left. Go to the next pullout 100 yards farther, directly across the road from a red house. Park.

Specific directions from access road (named above) to exact location of sampling site:
Walk to river.
Take sample from rocks at upstream end or area.

SITE LOCATION SHEET

Site Name: Deerfield River, Below Charlemont WWTP

Site Number: DER-021

Town: Charlemont

Nearest major highway: Rte 2

Road names and/or numbers connecting major highway to the site access road:
In Charlemont center, take the driveway to the waste water treatment plant.
Park at end of road.

Specific directions from access road (named above) to exact location of sampling site:
Walk around left of garage., through a field to woods on other side of field.
About 30 feet into the woods, turn right toward river bank.
Sample at large boulder.

Note: Call landowner ahead of time for permission to walk on his land.

SITE LOCATION SHEET

Site Name: Sunburn Beach

Site Number: NOR-002

Town: Colrain

Nearest major highway: Rte 2

Road names and/or numbers connecting major highway to the site access road:
From west of Shelburne Falls: Turn north off route 2 at the Big Indian Shop onto North River Road and go 1.0 miles to the iron bridge over the North River.

From Shelburne Falls: Follow signs to route 112 north (Main Street becomes 112 at the edge of town) and go 1.2 miles from the start of route 112 north to the left turn over the iron bridge.

Specific directions from access road (named above) to exact location of sampling site:
Park at the bridge and follow the path down to the Deerfield River and turn left. Sample the North River before it empties into the Deerfield. The North River flows under the iron bridge.

SITE LOCATION SHEET

Site Name: Green River - Meade Street (positive bacteria sample site)

Site Number: GRR-010

Town: Greenfield

Nearest major highway: Rtes 5&10

Road names and/or numbers connecting major highway to the site access road:
In Greenfield, from Rtes 5& 10 by Meadows golf course, travel north to second traffic light.
Turn left onto Mills St.
Take first left onto Meade St.

Specific directions from access road (named above) to exact location of sampling site:
Park next to big willow tree across from Berkshire Gas
There is a path on left of tree
Take sample at river bank.

SITE LOCATION SHEET

Site Name: North River, Above BBA (ex-Veratec)

Site Number: NOR-010

Town: Colrain

Nearest major highway: Rte 112

Road names and/or numbers connecting major highway to the site access road:
From Rte 2 in Shelburne, take Rte. 112 N to Colrain (about 3-4 miles)
Pass BBA Nonwoven factory on left.
Take a left on to Adamsville Road.
Cross the steel bridge.

Specific directions from access road (named above) to exact location of sampling site:
Park past bridge.
Downstream of bridge there is a trail. Walk down path to river. (beware of POISON IVY!)
Take sample at beach with large rocks. Big rock in middle of river.

SITE LOCATION SHEET

Site Name: North River, Below BBA (ex Veratec)

Site Number: NOR-015

Town: Colrain

Nearest major highway: Rte 112

Road names and/or numbers connecting major highway to the site access road:
From Rte 2 in Shelburne, take Rte. 112 N to Colrain (about 3-4 miles)
Just before BBA Nonwoven factory and steel bridge, turn right down dirt road (private driveway for 3 families).
At end of driveway (Crossman residence), park.

Specific directions from access road (named above) to exact location of sampling site:
Take private path to river for sampling

SITE LOCATION SHEET

Site Name: South River

Site Number: SOR

Town: Conway

Nearest major highway: Rte 116

Road names and/or numbers connecting major highway to the site access road:
From Rte 116 in Conway, take Shelburne Falls Rd.
Take a right onto Bardswell Ferry Rd.
Take a right on Reeds Bridge Rd.

Specific directions from access road (named above) to exact location of sampling site:
Take sample at bridge on Reeds Bridge Rd. (take sample upstream of bridge)

SITE LOCATION SHEET

Site Name: West Branch Deerfield River

Site Number: WER-050

Town: Readsboro

Nearest major highway: Rte 100

Road names and/or numbers connecting major highway to the site access road:
From center of Readsboro, travel north on Rte 100. Pass Fuel Oil on right and sawmill on left. The sample site is just upstream of the footbridge crossing the river on the left of the road.

Specific directions from access road (named above) to exact location of sampling site:
Walk down to footbridge. Sample site is just upstream, on east bank.

SITE LOCATION SHEET

Site Name: Main Branch Deerfield River

Site Number: DER-100

Town: Readsboro

Nearest major highway: Rte 100

Road names and/or numbers connecting major highway to the site access road:
From center of Readsboro, travel south on Rte 100. Park where road crosses river.

Specific directions from access road (named above) to exact location of sampling site:
Walk downstream on the west bank. Sample site is half-way between Rte 100 and confluence with West Branch.

SITE LOCATION SHEET

Site Name: West Branch Swimming Hole

Site Number: JGW-001

Town: Readsboro

Nearest major highway: Rte 100

Road names and/or numbers connecting major highway to the site access road:
From center of Readsboro, travel north on Rte 100 and around a slight curve to the right until you reach an intersection (Brooklyn St.). The Readsboro General Store is on the far side of that intersection. At this intersection, turn left and immediately park in the empty lot on your left.

Specific directions from access road (named above) to exact location of sampling site:
Just beyond where you parked is a vehicle bridge that crosses the West Branch. Walk across this bridge and on the far side walk down a steep bank following a stone-lined route that carries storm water off the road. At the foot of the steep part, follow a footpath though the woods that will take you to the bank of the West Branch at a point where the store sits on the opposite bank above a retaining wall. The sampling site is in the river at the point where swimmers have constructed a crude wall of stones to make a pool for swimming. You can stand on some of the larger stones making this wall and reaching upstream into the swimming pool.