Community Water Watch

PARTICIPANTS MANUAL

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MONROE COUNTY

Monroe County Department of Health

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I. INTRODUCTION

A. What is the Community Water Watch Program?

Community Water Watch (CWW) is a volunteer stream monitoring program. The program was developed by a task group of the Monroe County Water Quality Management Advisory Committee (WQMAC). The WQMAC is comprised of volunteers who advise Monroe County on water quality issues and assist with educational outreach. The purpose of the program is to utilize citizen volunteers to track the health of our local streams, identify problems that may need correction, and foster stewardship of our local water resources.

Participation in the program consists of the following core activities.

- Adopt a one-half mile segment of stream
- Conduct an annual watershed walk
- Conduct a visual survey and analyze benthic macroinvertebrate four times per year at two different locations along your adopted stream
- Perform an educational outreach activity
- Submit data to the Program Coordinator

Also, there are several optional activities such as tree planting, litter pick-ups, and storm drain stenciling that teams may wish to perform. Teams are asked to commit to the program for at least two years so as to facilitate data collection continuity.

B. Why is the CWW Program Important?

The Monroe County Health Department and the New York State Department of Environmental Conservation conduct regular monitoring of several of our larger local water bodies. However, government agencies do not have the resources to monitor the numerous smaller streams throughout our community. Therefore, we know very little about the condition of these smaller streams and how their condition may be changing over time. The Community Water Watch volunteers help to fill this gap. They are our "eyes and ears" in the field. They assess the health of our streams, document trends, and identify problems that may require action.

C. Water Quality Basics

Sources of water pollution are divided into two types, point source pollution and nonpoint source pollution.

1. Point Source Pollution

Point sources of pollution are sources that can be traced to a fixed location such as a wastewater discharge pipe. Many programs at the federal, state, and local level address these types of sources. Federal and State laws limit the discharge of pollutants through permits that set

requirements for minimum wastewater treatment. Local efforts include the consolidation of the many small wastewater treatment plants that discharged to streams into large facilities that discharge directly to Lake Ontario. In general, streams do not have the volume to assimilate large quantities of pollutants. As part of your Watershed Walk, you may identify some point sources of pollution to your stream.

2. Nonpoint Source Pollution

Nonpoint sources of pollution are sources that can not be traced to a single, identifiable source such as a factory or wastewater treatment plant. Research indicates that collectively, these small, diverse, and diffuse sources are the primary cause of our local water quality problems. Most nonpoint source pollution is associated with stormwater runoff from impervious surfaces such as parking lots, roads, and rooftops. Many pollutants, such as phosphorus, are transported by the air, settle on these impervious surfaces and are washed into streams, rivers, and lakes during the next storm. Phosphorus can be a major problem because it stimulates the growth of algae. As algae decomposes, it depletes the oxygen levels in a water body, thus degrading its value as habitat for fish and wildlife.

Typically, impervious surfaces are contaminated with a range of pollutants including automobile related pollutants such as gasoline, oil, antifreeze, and road salt. As stormwater flows over the contaminated surface, the pollutants are picked up and transported to local water bodies. In most cases, stormwater is discharged directly to our water resources without any treatment.

As land is developed and the amount of impervious surfaces increases, increasing quantities of stormwater are discharged into local streams rather than absorbed by the soil. This increased stream flow contributes to erosion and downstream sedimentation. Excessive quantities of sediment can degrade the quality of stream habitat for fish and other aquatic organisms. For example, sediment can fill in the riffles (shallow, rapidly flowing areas of the stream with a gravel substrate) and pools that fish use for spawning, foraging, and shelter.

Stormwater runoff can also be a major contributor to thermal pollution of our water resources. As stormwater flows across a hot parking lot, its temperature increases. When this heated stormwater is discharged into a stream, it increases the temperature of the water in the stream. This negatively impacts many species of aquatic life, such as trout, which require cool water and high levels of dissolved oxygen in order to survive.

The improper use, maintenance, or design of septic systems can also contribute to nonpoint source pollution of our water resources. A septic system that is not functioning properly can result in bacteria or hazardous household chemicals seeping into the groundwater.

Agricultural activities can also be a source of nonpoint source pollution. Stormwater runoff from croplands may carry sediments, nutrients, and pesticides to local waterways. However, a number of practices have been developed in order to minimize the impact of agricultural activities on

water quality. The improper or excessive use of lawn care chemicals (fertilizers and pesticides) can also be a source of pollutants to our water resources.

As you perform your Watershed Walk and Visual Surveys, you will probably identify many nonpoint sources of pollution to your stream. These sources should be noted on your map and considered when you are completing your Watershed Walk and Visual Survey forms.

D. Building Your Community Water Watch Team

The Team:

Participating in the CWW program is a team activity because many of the monitoring methods require several people to perform. Most of our teams have 3-5 members. Keep your team to a reasonable size so that it is not too difficult to schedule and organize your monitoring activities. Most teams consist of family members or groups of friends, neighbors, or co-workers. Children are also encouraged to participate. Many of our teams include children and young adults who enjoy the hands-on aspect of many of the monitoring activities. Participation in this type of program can help to foster a spirit of environmental stewardship among children and young adults. It is important, however, that an adult be responsible for each child when the team is in the field. As you are developing your team, you may identify individuals who are interested but unable to participate in the field activities. You may want to ask these individuals to perform treasury, publicity, or data recording tasks.

The Team Leader:

Each team is asked to designate a Team Leader. Since this position requires some additional time and energy, the Leader should be someone with the necessary dedication to the project. The Team Leader is responsible for organizing and leading the field work, ensuring that safety procedures are followed, and submitting the data forms to the Program Coordinator.

II. Locating A Stream Segment To Monitor

One of your first activities as a program participant is to select a 1/2-mile section of stream to adopt. Most of our teams choose to monitor a stream segment near their home for convenience and because they have a vested interest in that particular stream. However, it you do not have a special interest in a particular stream, the Program Coordinator is available to assist you in identifying a stream that is in need of monitoring.

You are strongly encouraged to select a stream that can be accessed through public land (such as parks and school grounds) or land that is owned by a member of your team. Many of our parks are located along streams so in general it is not difficult to find public access to a stream. However, if you would like to monitor a stream from private property, it is essential to obtain

permission from the property owner through the established County process. Please contact the Program Coordinator for more information.

Once you have selected the segment of stream you would like to monitor, please contact the Program Coordinator. If the segment you would like to monitor is already being monitored by the County or another CWW team, or is not an appropriate site for some other reason, the Program Coordinator will assist you in identifying an alternative stream segment to monitor. Upon finalizing your selection of a stream segment to monitor, please notify the property owner(s) (i.e. parks department, school district, etc.) as a courtesy.

III. Liability Issues

The Community Water Watch program is designed to be a safe, fun, and educational activity. Nevertheless, in recognition of potential hazards, Monroe County requires that all Community Water Watch teams possess their own liability and workers compensation coverage. In addition, each team must enter into a standard written agreement with the County. Many teams are comprised of members of existing nonprofit organizations or clubs that already possess liability and workers compensation coverage. However, if your team does not possess such coverage, contact the Program Coordinator in order to determine if there is an acceptable alternative.

IV. Informing Your Local Government And Officially Registering With The Program

The next step is to contact local government officials such as your town supervisor, village mayor, and conservation board. Write a letter introducing yourself and the program. Describe the activities you will be undertaking and request their support. It is important to establish a cooperative relationship from the start with these local officials who play such an important role in protecting water quality.

Once you have assembled a team and selected a stream segment to monitor, complete the registration form (Form #1 - found in the back of this manual) and submit it to the Program Coordinator. The Coordinator will then assist you in completing the administrative requirements.

V. Training

The training that you will need to participate in the Community Water Watch program is provided free of charge. At a minimum, a representative from each team is required to attend a 2-3 hour introductory training session. This representative can then pass along the information to the other team members. However, teams are strongly encouraged to send as many members as possible to a training session. The sessions are designed to be informative, interactive, and fun. For convenience, the training sessions are scheduled several times each year at various locations around the County. The following program basics are addressed.

- Overview of the Community Water Watch program

- Overview of closely related Great Lakes water quality initiatives
- Major components of the program including the Watershed Walk, the Visual Survey, benthic macroinvertebrate monitoring, and chemical monitoring
- Safety
- Conducting outreach activities

In response to requests from many of our volunteers, we now also offer "intermediate level" training sessions designed to improve our volunteers' benthic macroinvertebrate identification skills. Topics of special interest may also be addressed.

VI. The Watershed Walk

After you or a representative from your team has attended a training session, your first field activity will be the "Watershed Walk." However, before you head out into the field it is important that everyone on your team understands the definition of a "watershed." A watershed is the area of land that drains into a stream or river. Hills, mountains, and ridges commonly form the boundary between neighboring watersheds, as they determine the direction of water flow. In many cases, your stream's watershed may be much larger than you might guess. For example, the Irondequoit Creek watershed is approximately 169 square miles in size and includes areas within the towns of Brighton, Henrietta, Mendon, Penfield, Perinton, Pittsford, and Victor as well as the villages of East Rochester, Fairport, and Pittsford. The use of land throughout this large watershed affects water quality in Irondequoit Creek and Bay.

The purpose of the Watershed Walk is to assess land use patterns and to identify potential sources of pollution in your stream's watershed. The Watershed Walk consists of exploring the 1/2-mile segment of your stream that you plan to monitor as well as one-mile upstream from your segment. In particular, note any ditching, stormwater or wastewater discharge pipes, streambank erosion, construction sites, large areas of impervious surfaces or other land uses that may be affecting the water quality of your stream.

Review the Watershed Walk Form (Form #2 - found in the back of this manual) before you start your walk so that you know the types of features that you are asked to document. We also recommend that you obtain a copy of the United States Geological Survey (USGS) topographic map that includes your watershed so that you can mark the location of possible sources of pollutants, various land uses, and other points of interest. Copies of the USGS maps are available from the Program Coordinator, camping supply stores, and on the internet.

While you are exploring your stream's watershed, your team should select the two locations where you will conduct your Visual Surveys and benthic macroinvertebrate monitoring each quarter. Your two monitoring locations should be at least 1/4 mile apart. Most teams choose to monitor upstream and downstream from a potential source of pollutants such as a stormwater discharge pipe. This may give you an indication if the possible polluting source is causing damage. You should also consider ease of access and land ownership when selecting your monitoring

locations. Ideally, your monitoring locations should be easily accessible at any time of the year and on public lands. Be sure to mark the locations of your monitoring sites on your topographic map so that you can locate them when it comes time to perform your Visual Surveys.

Most of the supplies that your team will need to conduct the Watershed Walk are found in the kit that you may borrow from the Program Coordinator (274-7638). It is important that you return the kit within one week so that it is available for use by other teams. Please clean and dry the contents of the kit after completing your field work.

The following supplies that you will need for the Watershed Walk are contained in the kit.

- Watershed Walk Survey Form (Form #2)
- List of Safety Procedures
- Clipboard
- Fluorescent tape for marking your monitoring sites (optional)
- Compass
- First aid kit

You may find the following optional supplies useful when conducting your Watershed Walk. They are not found in the kit.

- A topographic map that includes your stream and its watershed
- Pencils or permanent markers
- Journal or notebook
- Camera
- Cellular phone
- Whistle

While you are conducting your walk or soon after you finish, complete Form #2 found in the back of this manual and submit it to the Program Coordinator. Your team is asked to conduct a watershed walk once each year so that you are aware of any changes in land use and other activities in your watershed that may be affecting water quality.

VII. The Visual Survey

The "visual survey" and associated benthic macroinvertebrate monitoring is the heart of the Community Water Water program. The benthic macroinvertebrate monitoring is explained in detail in the next section. With the visual survey, you will be assessing and documenting the quality of the water in your adopted stream. These records will help us to identify changes in water quality over time and any problems that may need to be addressed. Your team is asked to conduct a visual survey (and benthic macroinvertebrate monitoring) at each of your two monitoring locations (that you selected during your watershed walk) four times each year, once each season.

As with the Watershed Walk, most of the supplies that you will need to conduct the Visual Survey are found in the kit that you may borrow from the Program Coordinator (274-7638). Please return the kit within one week so that it is available for use by other teams.

The following supplies that you will need for the visual survey are found in the kit.

- Two "Visual Survey Forms" (Form #3) - one for each monitoring site
- List of safety Procedures
- Clipboard
- Measuring tape
- Yardstick
- Thermometer (non-mercury)
- Compass
- First aid kit
- Surveying tape

The following supplies that you may find useful for the visual survey are not found in the kit.

- Pencils or permanent markers
- Journal or notebook
- USGS topographic map (that you marked up during your watershed walk)
- Calculator
- Float device to measure velocity (an orange is effective for larger streams, while a cork works well in smaller ones)
- Cell phone
- Camera
- Stop watch with 0.1 second reading
- Gloves to use in the water, or clean wipes to wash or disinfect hands after touching water

At the new volunteer training sessions, each element of the Visual Survey is explained and demonstrated in the field. What follows below, is a basic introduction and overview of several of the more important elements of the Visual Survey.

Water Level: Use your best judgment to determine whether the stream flow is high, normal or low relative to the season. For example, during spring runoff, you would expect high flows in your stream. So, if during your spring Visual Survey, you observed high flows, you would place a mark next to "normal" on your form. However, if there was above average snowfall, the stream flow could be particularly high. In this case, the form would be marked "high".

Riffles and Pools: Riffles and pools provide critical habitat for many organisms. A "riffle" is a relatively shallow, highly oxygenated area with a gravel substrate where the water moves quickly and bubbles. A "pool" is a deeper area where water slows down. Count the number of pools and the number of riffles in your 75 feet long monitoring area and record.

Stream Flow: The volume of flow in your stream can be important in determining the quantity of pollutants being discharged by your stream to receiving waters. Calculating flow is a several step process. First, at your monitoring site, measure the width of your stream using the measuring tape found in the kit. Be certain that the location where you measure is fairly representative. Next, measure the depth of your stream at 5 regular intervals across the stream. For example, if the width of your stream is 10 feet you could measure the depth every two feet. Record this information on Form #3 and calculate the average depth.

Next, select a 10-15 foot long section of your monitoring site that appears to be uniform in its flow. A member of your team should stand at each end of the section. Place your float (orange, cork, etc.) in the water at the upstream end of your section and record the time it takes to travel from the starting point to the end point. Be certain to catch your float before it is carried downstream. Divide the distance traveled by the time in seconds in order to determine the velocity (feet/second). Repeat two additional times. Calculate the average velocity and record it on the form with your other data.

Using the information collected in the previous steps, you are able to calculate the stream flow volume using the following formula.

Stream flow volume (cubic feet per second) =
average stream depth (feet) x
stream width (feet) x
average stream velocity (feet per second)

Appearance and Odor: Refer to the list of possibilities on Form #3. Odor and appearance can be indicative of certain water quality problems. For example, muddy water would be indicative of erosion problems.

Habitat Characteristics: Please refer to the table on the reverse side of Form #3 for information that will help you assign your rankings. This section of the Form includes several terms that may be new to you. "Stream bed" refers to the bottom substrate of the stream that consists of gravel, rocks, and sediment. "Sediment deposits" include materials such as eroded soil, leaves, and twigs. Too much sediment will cloud the water enough to block sunlight and inhibit photosynthesis. "Streambank stability" refers to the degree of erosion found along your monitoring site and "streambank cover" is a measure of the percentage of the streambank that is covered by vegetation. The vegetation that grows along a stream is critical for minimizing erosion and maintaining proper stream temperature for fish and other organisms.

Algae: Algae are simple plants that are found naturally in rivers, lakes, and streams. They can be green or brown and may be found floating or attached to rocks and logs. Algae are an important part of the ecosystem. However, certain types of pollution may result in excessive quantities of algae.

Other Observations: At the bottom of the form, please record any other observations that you make regarding the health of your stream. These may include signs of wildlife, evidence of pollution, or other signs of human impact.

VIII. Benthic Macroinvertebrate Monitoring

Benthic macroinvertebrates are organisms that dwell in the mud at the bottom of streams and rivers, can be seen with the unaided eye, and lack a spine. In flowing water, most benthic macroinvertebrates are aquatic insect larva that live on or under rocks and gravel. These organisms are excellent indicators of water quality and are fairly simple to monitor. Appendix D "Stream Insects and Crustaceans", shows several examples of what you might find in your stream. The presence of these organisms at your monitoring site is a useful indicator of water quality for several reasons. They range in sensitivity to physical and chemical conditions in their environment and may live in the water for over a year. They are easy to collect and therefore useful in assessing overall water quality.

If you find….	**It may indicate…**
A variety of insects, many of each type	A healthy stream
Little variety of insects but great abundance of pollution tolerant species	Water is enriched with excess organic matter or high in nutrients
Few insects and streambed is covered with sediment	Poor habitat possibly resulting from sedimentation
A wide variety of insects but only a few of each kind	Water is low in nutrients
No insects, but the stream looks clean	Toxic pollution or acid precipitation

Your team is asked to collect and analyze benthic macroinvertebrates each time you conduct your visual survey (once each season) because they are such good indicators of water quality. All the supplies that you will need are included in the kit that is available from the Program Coordinator. As always, please remember to return the kit within one week so that it is available for use by other teams.

The following **supplies** are included in the kit for use in collecting and analyzing benthic macroinvertebrates.

- Aquatic D-frame net
- Shallow plastic pan
- Seven (7) labeled petri dishes
- Pipettes
- Magnifying glass
- Tweezers or forceps
- Spray bottles for removing the macroinvertebrate sample from the net
- Macroinvertebrate Identification Chart (Appendix D)

- Copies of the Benthic Macroinvertebrate form

The methods that you will use to collect and analyze your benthic macroinvertebrate samples are briefly described below. They are explained and demonstrated in detail at the required training session. As always, please adhere to the safety tips listed in Appendix C. Most importantly, remember to never enter your stream if the water will be above your knees. If there is any doubt, use the meter stick included with the kit to measure the depth of your stream before entering.

Step 1: Select an area of your monitoring segment that fits the description of a riffle (a shallow, fast flowing area with a gravel substrate). The riffle areas of your stream will contain the greatest diversity of macroinvertebrates because they are rich in oxygen. To the greatest extent practicable, your site should be representative of your stream as a whole in terms of current speed, substrate type, and canopy cover.

Step 2: Use the "Travelling Kick Method" to collect your sample of benthic macroinvertebrates. Kick sampling is a method of sampling benthic organisms by disturbing bottom sediments and catching the dislodged organisms downstream with an aquatic net. As shown below, position the

aquatic D-frame net in the water approximately 1-1/2 feet downstream from where you are standing. Disturb the stream bottom with your feet so that macroinvertebrates are dislodged from the rocks and other substrate and carried into the net by the current. Be certain that the net fits securely against the bottom of the stream so organisms are not carried under the net. Continue to disturb the stream bottom for five minutes while moving approximately 5 meters in a diagonal direction across the stream. This method will ensure that your sample includes macroinvertebrates from the various microhabitats within your stream.

Step 3: Rinse the contents of your net in the stream and empty it into the plastic tray. Remove any rocks, sticks, or plant debris. Select a small portion (golf ball size) of your sample. From this sub-sample, select 100 random macroinvertebrates. Using the chart in the Participants Manual

(Appendix D), sort the 100 organisms into the 7 categories (worms, mayflies, stoneflies, beetles, caddisflies, midges, and other) listed on Form #4 "Macroinvertebrate Data - Percent Model Affinity Method." The sorted organisms should be placed into the labeled petri dishes found in the kit. Keep track of how many organisms are in each dish and record this information on Form #4. If your sample does not contain 100 organisms, then count 50 and multiply the number of organisms identified in each category by 2 and record this information in the "% (#) in Sample" column on Form #4.

Step 4: Complete Form #4. Compare the values in the "% (#) in Sample" column and the "Model %" column, and record the lesser of the two values in the "Lesser Value" column. Calculate the sum of the values in the "Lesser Value" column. Compare the sum with the values listed will tell you whether your stream is and mark the appropriate category under the "Water Quality Impact" heading. With the Percent Model Affinity method, you will be comparing your sample to a model of a macroinvertebrate community in a healthy stream in New York State. If your sample is similar to the model, that is an indication of good water quality. If there is a significant difference between your sample and the model, that is an indication that the water quality in your stream may be poor.

Step 5: Submit your completed macroinvertebrate data form to the Program Coordinator, along with your completed visual survey, as soon as possible.

IX. Optional Activities

Although the following activities are not required, they are lots of fun and will contribute to protecting and improving water quality in your stream.

A. Litter Pick-Up

Your Community Water Watch Team may find litter on the land on either side of your stream or in the stream itself. After exploring the area during your watershed walk, your team may decide that the area is in need of a litter pick-up. Many of our teams choose to conduct regular litter pick ups as part of their quarterly visual survey and benthic macroinvertebrate monitoring. The supplies (garbage bags and plastic gloves) that you would need to conduct a litter pick up are available from the Program Coordinator. Your team should only collect litter that you are certain is not hazardous. Any large or potentially hazardous objects should be reported to your municipal department of public works. If you do not wish to incur the cost of garbage disposal, your town or village may be able to provide assistance.

B. Storm Drain Stenciling

Storm drain stenciling is another popular optional activity. Many people are not aware that typically, water from storm drains discharges into streams, creeks, ponds, the Genesee River, Lake Ontario, or groundwater sources without any treatment. Certain areas within the City of

Rochester are the exception. In these areas stormwater runoff is treated at the Van Lare Wastewater Treatment Plant before being discharged to Lake Ontario. In an effort to educate the public about the dangers of disposing of hazardous and non-hazardous wastes into storm drains, the Monroe County Department of Environmental Services sponsors storm drain stenciling. This activity consists of stenciling the words "Don't Dump" on the pavement next to storm drains. For more information and the necessary supplies, call the Monroe County Department of Environmental Services at 760-7610 ext. 7526.

C. Water Chemistry Monitoring

Community Water Watch teams may also choose to perform limited chemical monitoring of their streams at the same time that they are performing their visual surveys and benthic macroivertebrate monitoring. Water chemistry monitoring is not a major focus of the Program because the equipment is costly and this type of monitoring has certain limitations. With water chemistry monitoring, measurements must be taken frequently and regularly because the numbers can vary significantly for a number of reasons. Water chemistry data only provide a "snapshot" of the condition of a stream at the moment that the sample was collected whereas the benthic macroinvertebrate community reflects the condition of the stream over a longer period of time.

The techniques that your team would use to conduct water chemistry monitoring are explained and demonstrated at the training sessions. Currently, we have the equipment so that you can measure dissolved oxygen, pH, and conductivity. Contact the Program Coordinator in order to make arrangements to borrow the equipment.

<u>Dissolved Oxygen</u>:

Dissolved oxygen (DO) is a standard parameter to monitor because fish and aquatic macroinvertebrates have specific oxygen requirements. Trout generally need at least 6 mg/L of DO whereas carp can survive at much lower oxygen levels. DO levels fluctuate seasonally and over a 24-hour period. They also vary with water temperature, altitude, and horizontally along the course of a stream. Cold water holds more oxygen than warm water and water holds less oxygen at higher altitudes. The DO levels in and below riffle areas, waterfalls, or dam spillways are typically higher than those in pools and slower moving stretches.

A stream system both produces and consumes oxygen. It gains oxygen from the atmosphere and from plants as a result of photosynthesis. Running water, because of its churning, dissolves more oxygen than still water. Respiration by aquatic organisms, decomposition, and various chemical reactions consume oxygen. Wastewater from sewage treatment plants, stormwater runoff, and the discharge from failing septic systems contain organic materials that are decomposed by microorganisms, which use oxygen in the process.

<u>pH</u>:

The pH of the water in your stream is another standard parameter to measure because it affects many chemical and biological processes. The pH values indicate the acidity or alkalinity of a substance as ranked on a logarithmic scale from 1.0 to 14.0. A pH below 7 is acidic and a pH above 7 is alkaline. A pH of 7 is neutral.

Different organisms flourish within different ranges of pH. Most aquatic organisms prefer a range of 6.5 to 8.0. A pH outside this range reduces the diversity in the stream because it stresses the physiological systems of most organisms and can reduce reproduction. Low pH can also allow elements (e.g. metals) and compounds to become more "available" for uptake by aquatic organisms. This can produce conditions that are toxic to aquatic life, particularly to sensitive species such as certain trout. Changes in pH can be caused by atmospheric deposition (acid rain), the presence of certain minerals, and wastewater discharges.

Conductivity:

Conductivity is also a useful parameter to monitor because it is a good general measure of stream water quality. Conductivity is a measure of the ability of water to pass an electrical current. The conductivity of a stream is affected by the surrounding geology and by various constituents that may be present in the water. The basic unit of measurement of conductivity is microsiemens per centimeter (uS/cm). Each stream tends to have a relatively constant range of conductivity that can be used as a baseline for comparison with regular conductivity measurements. Any significant changes in conductivity could be an indication that a discharge, or some other source of pollution (e.g. road salt), has entered the stream.

D. Tree and Shrub Planting

Another optional activity that we encourage your team to consider is tree and shrub planting. The trees and shrubs that grow along the banks of a stream perform a number of valuable functions. Their roots bind the soil and minimize erosion that can degrade water quality. Trees and shrubs also provide shade that helps to maintain proper stream temperature for fish and other organisms and they provide critical habitat for terrestrial wildlife.

On an occasional basis, the Program Coordinator will have free tree and shrub seedlings that your team can plant along your stream. The availability of these seedlings will be announced through the program newsletter. Planting instructions will also be provided. Before you do any planting, be certain that you have the permission of the property owner.

E. Great Lawns/Great Lakes Program

The Great Lawns/Great Lakes (GL/GL) program is another optional activity for your team to consider. The GL/GL program is designed to educate homeowners regarding lawns care practices that protect water quality. Many homeowners may not realize that when lawn fertilizers and pesticides are applied improperly, these products can be transported by stormwater runoff to the

nearest water body and degrade water quality. The program is coordinated by Cornell Cooperative Extension of Monroe County with assistance from several other organizations in the community. A number of easy to understand educational materials were developed for use with the program. Your team could distribute these materials to homeowners along your stream in order to encourage lawn care strategies that protect water quality. For more information, contact the Program Coordinator.

X. Submitting your Data and Performing a Public Outreach Activity

As soon as you complete any of your monitoring activities, be certain to submit your data form to the Program Coordinator at the address found at the bottom of the form. It is critical that you submit your data immediately so that any problems that you may have identified can be acted upon as soon as possible.

We also ask that each of our Community Water Watch teams perform at least one public outreach activity. The purpose of the public outreach activity is to promote public stewardship of our local water resources and to encourage residents to do their part in reducing nonpoint source pollution. There are a number of outreach strategies that your team could use including working with the media, presenting to community groups, participating in environmental events, and offering a watershed tour. Many of our teams invite their local community newspaper to attend one of their monitoring activities. The response has been very enthusiastic and a number of really nice articles about Community Water Watch have been featured in these newspapers.

Presenting to community groups or at environmental events is another outreach strategy that your team may want to consider. Your municipal conservation/environmental board, Rotary or Lions Clubs, or school science clubs may be potential audiences. If you need any additional ideas or guidance, contact the Program Coordinator.

XI. How the Data Will Be Used

After each watershed walk or visual survey, please submit your data form to the Program Coordinator (keep copies for your team) as soon as possible. At the end of each calendar year, your Team Leader is asked to compile the data and summarize it in the annual report format (Form #5). This report should also be submitted to the Program Coordinator. The Community Water Watch Task Group meets on a periodic basis to review and analyze all the data submitted by our teams.

The data generated by your team will be used for troubleshooting, tracking water quality, and public outreach. The Monroe County Environmental Health Laboratory, in cooperation with the United States Geological Survey, maintains permanent monitoring stations on Black, Honeoye, Irondequoit (5 stations throughout the watershed), Northrup, and Oatka Creeks. However, because of limited resources, it is not possible to monitor the many smaller streams in the County.

Your team will help to fill this gap by serving as our "eyes and ears" in the field. If your team observes any serious problems with your stream, you are asked to contact the Program Coordinator immediately. A decision will be made as to what agency can best address the specific problem. For example, if there is unusual foam found in a stream, the Monroe County Environmental Health Laboratory may need to do some sampling. Or, if there appears to be a problem related to individual septic systems, the Health Department may need to do an inspection. Serious streambank erosion situations may be referred to the Monroe County Soil & Water Conservation District for prioritization and remediation.

The data that your team collects may be the only water monitoring data that exist regarding your stream. Therefore, they will provide us with a picture of the health of your stream and how that may be changing over time. The data that your team collects will also be very valuable for public outreach. As explained in Section I, nonpoint source pollution is the primary contributor of pollutants to our local streams. There are many actions that residents can take to reduce this type of pollution. The example that your team sets in helping to protect your stream, and the public outreach that you perform, will help to foster environmental stewardship in the community.

XII. Continuing with the Program

After your group has completed your two-year commitment, please consider continuing with the Program. Long-term participants are particularly valuable because they are very knowledgeable, generate high quality data, and help ensure data consistency. If you are interested in helping protect water quality, but are not able to make a two-year commitment, please contact the Program Coordinator to learn about other opportunities.

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- Delta Laboratories "Adopt-A-Stream"
- GREEN Field Manual for Water Quality Monitoring
- Georgia "Adopt-A-Stream Program"
- Izaak Walton League of America "Save Our Streams"
- United States Environmental Protection Agency "Volunteer Stream Monitoring: A Methods Manual"

We would like to acknowledge the following individuals for their valuable assistance with our Community Water Watch program.

- Margit Brazda, Water Education Collaborative at the Rochester Museum & Science Center
- Gary Brown, Monroe County Environmental Health Laboratory
- Margaret Cleary, Monroe County Health Department
- Charles Daniels, Village of Churchville
- Joseph Gorsuch, Eastman Kodak Company
- William Hallahan, Nazareth College
- Gary Neuderfer, New York State Department of Environmental Conservation
- Todd Stevenson, Monroe County Health Department

APPENDIX A
Stream Team Recruitment Strategy and Target Groups

Categor	Groups	Strategy
Youth Groups	School Science Clubs Boy Scouts Girl Scouts Church Youth Groups YMCA, YWCA, 4-H	* Call parent organization to identify groups and group leaders. * Send form letter to group leader. * If group leader responds, schedule a meeting to discuss Community Water Watch. * Send representative to speak at group meeting to describe program.
Adult Participant Groups	Church groups Lions Clubs Rotary Kiwanis Clubs Garden Clubs	* Send inquiry (form letter) to organizations (churches). * Send representative to speak at group meeting.
Business	Chamber of Commerce	* Publicize in business journals, newspapers, Chamber of Commerce meetings, etc.
City/Town Governments	Conservation Boards Planning Boards	* Send inquiry (form letter) to organizations. * If group responds, schedule a meeting to discuss Community Water Watch. * Send representative to speak at group meeting to describe program.
General Public		* Publicize program: articles in local newspapers, posters, radio announcements, and web sites. * Set up organizational meeting in community. * Conduct organizational meeting, suggest stream segment etc. * Have group select leader. *Collect names of interested people.

APPENDIX B

Who to Call

Community Water Watch Program Coordinator	(585) 274-7638
New York State Department of Environmental Conservation Region 8, Avon (Contact: Gary Neuderfer)	(585) 226-2466
Monroe County Environmental Health Laboratory	(585) 274-6820
Monroe County Household Hazardous Waste Collection Facility	(585) 760-7600
Monroe County Department of Health (General Pollution Problems)	(585) 274-6052
Monroe County Department of Environmental Services (Storm Drain Stenciling supplies)	(585) 760-7610 ext. 7526
Monroe County Planning and Development Department (Map Questions)	(585) 428-5335
New York State Department of Environmental Conservation Spill Hotline (24 hours/day, 7 days/week)	(800) 457-7362
To Report a pollution related emergency** 8:30 a.m. to 4:30 p.m.	(585) 274-6052
Call the Office of Emergency Communications to report an emergency after normal business hours	911

**** The following are some examples of emergencies, or situations that require IMMEDIATE ATTENTION:**

- **HEAVY FLOWS OF UNTREATED SEWAGE**
- **INDUSTRIAL/CHEMICAL DISCHARGE**
- **PETROLEUM SPILLS**
- **LARGE NUMBERS OF DEAD FISH**
- **CONTAINERS SUSPECTED OF CONTAINING HAZARDOUS OR MEDICAL WASTES**

Important Numbers in Monroe County

City Hall

*City of Rochester	428-7000

Town Halls

* Brighton	472-8800
* Chili	889-3550
* Clarkson	637-1130
* Gates	247-6100
* Greece	225-2000
* Hamlin	964-2421
* Henrietta	334-7700
* Irondequoit	467-8840
* Mendon	624-6060
* Ogden	352-2100
* Parma	392-9461
* Penfield	377-8600
* Perinton	223-0770
* Pittsford	248-6200
* Riga	293-3880
* Rush	533-1312
* Sweden	637-2144
* Webster	872-1000
* Wheatland	889-1553

Village Offices

Brockport	637-5300
Churchville	293-3720
East Rochester	586-3553
Fairport	223-0313
Hilton	392-4144
* Honeoye Falls	624-1711
Pittsford	586-4332
Scottsville	889-4700
Spencerport	352-4771
Webster	265-3770

All numbers are in the (585) area code.

* Indicates that the municipality has a Conservation Board or Environmental Services Division (City of Rochester only)

APPENDIX C
Safety Procedures

For your own safety, please adhere to these procedures while conducting your monitoring activities.

- Never enter the field alone. Always visit your segment with at least one other person. This way, someone can go for help if necessary.

- Always wear appropriate clothing. This includes waterproof, non-skid footwear and long pants.

- Never monitor your stream if the water level will be higher than your knees. Use the meter stick to measure the depth before entering your stream.

- Be extremely careful when walking in the stream. Beware of slippery rocks.

- During monitoring, keep your hands away from your mouth and eyes. Do not eat after monitoring until you have washed your hands thoroughly with soap and water.

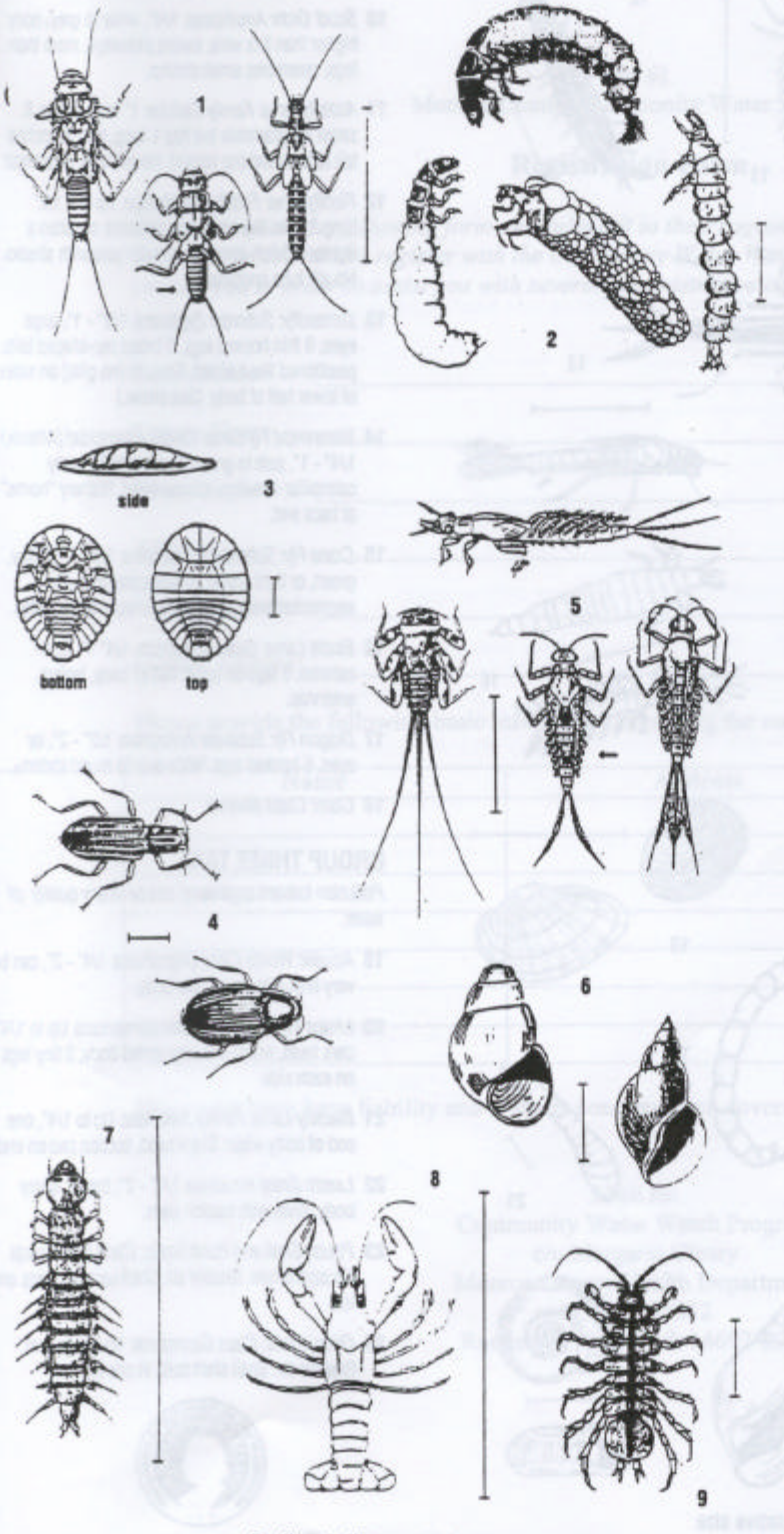
- Always have a cellular phone with you, or know the location of the nearest available phone in case of an emergency.

- Do not enter into or touch your stream if the water appears to be severely polluted, has a strong chemical smell, or contains several dead fish. Report problems to the proper authorities.

- Be aware of the possibility of snakes when working in aquatic environments. Hitting the ground with a large stick as you walk will cause snakes to feel the vibrations and move away. If you happen to encounter a snake simply back away. Leave it alone and it will leave you alone.

- Please remember that you are walking in the habitats of living creatures. Try to have as little impact on the animals and their environments as possible.

- Remember that a first aid kit is included in the kit of supplies.



Bar lines indicate relative size

Stream Insects & Crustaceans

GROUP ONE TAXA

Pollution sensitive organisms found in good quality water.

1 *Stonefly: Order Plecoptera.* 1/2" - 1 1/2", 6 legs with hooked tips, antennae, 2 hair-like tails. Smooth (no gills) on lower half of body. (See arrow.)

2 *Caddisfly: Order Trichoptera.* Up to 1", 6 hooked legs on upper third of body, 2 hooks at back end. May be in a stick, rock or leaf case with its head sticking out. May have fluffy gill tufts on lower half.

3 *Water Penny: Order Coleoptera.* 1/4", flat saucer-shaped body with a raised bump on one side and 6 tiny legs on the other side. Immature beetle.

4 *Riffle Beetle: Order Coleoptera.* 1/4", oval body covered with tiny hairs, 6 legs, antennae. Walks slowly underwater. Does not swim on surface.

5 *Mayfly: Order Ephemeroptera.* 1/4" - 1", brown, moving, plate-like or feathery gills on sides of lower body (see arrow), 6 large hooked legs, antennae, 2 or 3 long, hair-like tails. Tails may be webbed together.

6 *Gilled Snail: Class Gastropoda.* Shell opening covered by thin plate called operculum. Shell usually opens on right.

7 *Dobsonfly (Hellgrammite): Family Corydalidae.* 3/4" - 4", dark-colored, 6 legs, large pinching jaws, eight pairs feelers on lower half of body with paired cotton-like gill tufts along underside, short antennae, 2 tails and 2 pairs of hooks at back end.

GROUP TWO TAXA

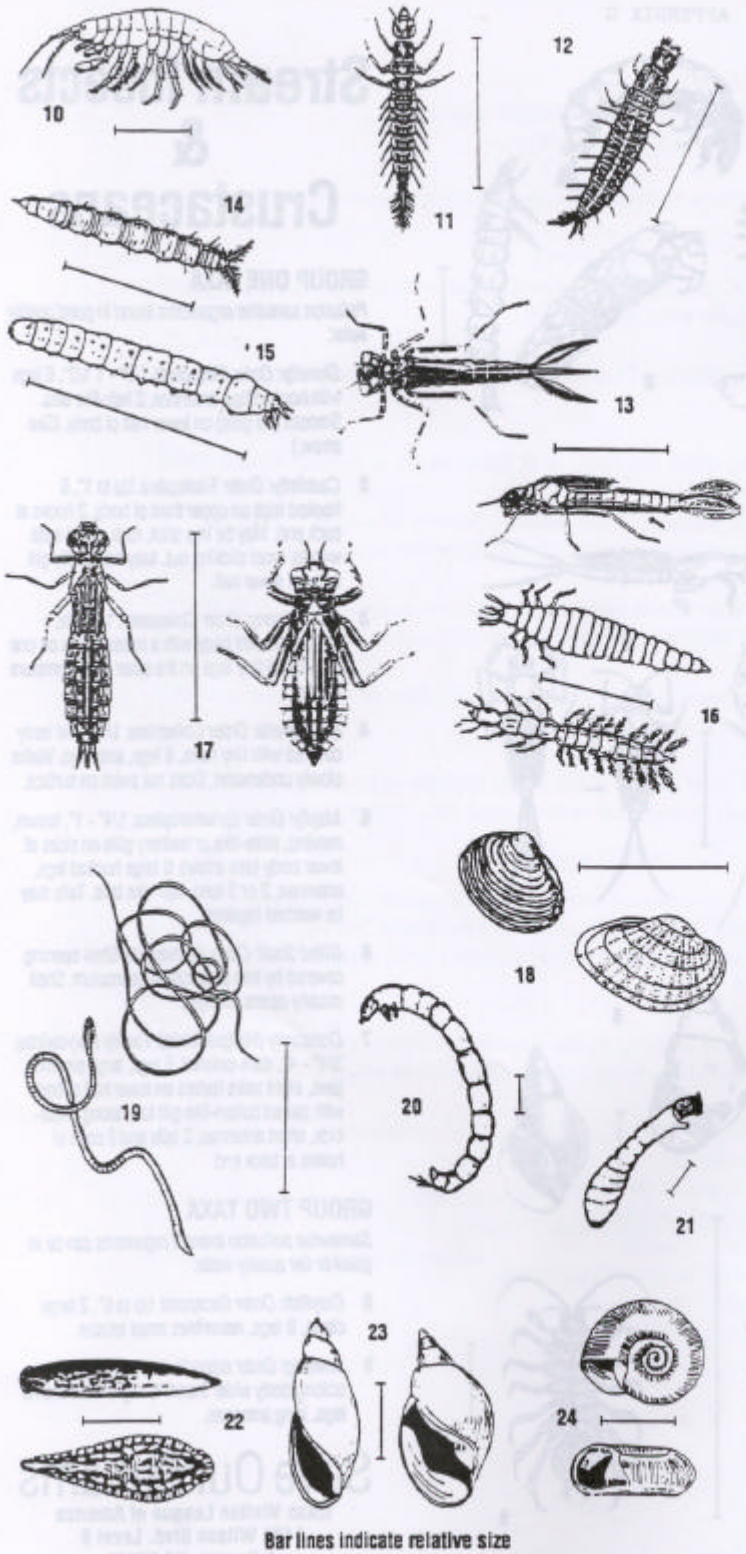
Somewhat pollution tolerant organisms can be in good or fair quality water.

8 *Crayfish: Order Decapoda.* Up to 6", 2 large claws, 8 legs, resembles small lobster.

9 *Sowbug: Order Isopoda.* 1/4" - 3/4", gray oblong body wider than it is high, more than 6 legs, long antennae.

Save Our Streams

Izaak Walton League of America
1401 Wilson Blvd. Level B
Arlington, VA 22209



GROUP TWO TAXA continued

10 *Scud: Order Amphipoda.* 1/4", white to grey, body higher than it is wide, swims sideways, more than legs, resembles small shrimp.

11 *Alderfly larva: Family Sialidae.* 1" long. Looks li. small hellgrammite but has 1 long, thin, branched tail at back end (no hooks). No gill tufts underneat

12 *Fishfly larva: Family Corydalidae.* Up to 1 1/2" long. Looks like small hellgrammite but often a lighter reddish-tan color, or with yellowish streaks No gill tufts underneath.

13 *Damselfly: Suborder Zygoptera.* 1/2" - 1", large eyes, 6 thin hooked legs, 3 broad oar-shaped tails positioned like a tripod. Smooth (no gills) on sides of lower half of body. (See arrow.)

14 *Watersnipe Fly Larva: Family Athericidae (Atherix)* 1/4" - 1", pale to green, tapered body, many caterpillar-like legs, conical head, feathery "horns" at back end.

15 *Crane Fly: Suborder Nematocera.* 1/3" -2", milky, green, or light brown, plump caterpillar-like segmented body, 4 finger-like lobes at back end.

16 *Beetle Larva: Order Coleoptera.* 1/4" 1", light-colored, 6 legs on upper half of body, feelers, antennae.

17 *Dragon Fly: Suborder Anisoptera.* 1/2" - 2", lar eyes, 6 hooked legs. Wide oval to round abdom...

18 *Clam: Class Bivalvia.*

GROUP THREE TAXA

Pollution tolerant organisms can be in any quality of water.

19 *Aquatic Worm: Class Oligochaeta.* 1/4" - 2", can b very tiny; thin worm- like body.

20 *Midge Fly Larva: Suborder Nematocera.* Up to 1/4" dark head, worm-like segmented body, 2 tiny legs on each side.

21 *Blackfly Larva: Family Simuliidae.* Up to 1/4", one end of body wider. Black head, suction pad on end.

22 *Leech: Order Hirudinea.* 1/4" - 2", brown, slimy body, ends with suction pads.

23 *Pouch Snail and Pond Snails: Class Gastropoda.* No operculum. Breathe air. Shell usually opens on left.

24 *Other snails: Class Gastropoda.* No operculum. Breathe air. Snail shell coils in one plane.

Form #1

Monroe County Community Water Watch

Registration Form

Please complete the following form and submit it to the Program Coordinator at the address listed below in order to register with the Community Water Watch program. Program staff will contact you in order to assist you with several administrative issues.

Team Name: _____

Stream Name: _____

Team Leader: _____

Address: _____

Phone Number: _____

E-Mail Address: _____

Please provide the following basic information regarding the members of your team:

Name	Address	Telephone #

Does your team have liability and workers compensation coverage? Yes No

Mail to:
Community Water Watch Program
c/o Margaret Cleary
Monroe County Health Department
PO Box 92832
Rochester, New York 14692-893

Form #2
Monroe County Community Water Watch

Watershed Walk Survey

Stream Name:_____Date:_____

Stream Segment:_____
(Please attach a map that shows your stream segment and other landmarks such as road crossings, etc.)

Group Leader:_____Phone:_____

Participants:_____

_____

Date of last rainfall: _____ Water flow: High___ Normal___ Low___

Weather conditions: _____ Air temperature:_____

AFTER THE WATERSHED WALK: SUMMARY

For each of the categories listed in the chart on the reverse side, please circle the appropriate condition. Summarize your observations below being certain to comment on the following.

1. Overall conditions
2. Any conditions that warrant particular attention, or
3. Conditions that may have changed along the length of your segment.

Land use:_____

Bank conditions:_____

Water and water surface: _____

Stream bed: _____

Human impacts: _____

Overall assessment (from scale on back):

Excellent_____ Good/Fair _____ Poor _____

Please submit your completed form to:
Community Water Watch Program
c/o Margaret Cleary
Monroe County Health Department
PO Box 92832
Rochester, New York 14692-8932

WATERSHED WALK SURVEY

Please circle the condition that best describes your stream segment for each category. Consider the 1-mile area upstream of your stream segment as the watershed for ranking purposes.

Category	Excellent Condition	Fair/Good Condition	Poor Condition
Land use by the stream	undisturbed, good cover all year	little to moderate cover, some bare ground and some paved	bare dirt or completely paved, maximum disturbance
Banks - erosion	no erosion dirt is covered, no evidence of soil loss	moderate erosion some exposed dirt and some cover, slight evidence of soil loss, gentle slope	severe erosion exposed dirt, obvious loss of soil, steep slope
Banks - vegetation	good vegetation cover	moderate vegetation problems at high flow times	little or no vegetation exposed dirt
Water surface	no slick, film or foam	slight film or foam	film or foam is pronounced
Water color/clarity	clear water	little color or slight loss of clarity	highly colored or low clarity
Water odor	no odor	slight odor	severe odor
Stream bed siltation	no silt no erosion	slight silt some erosion	much silt shows erosion
Algal growth in stream	Moderate algal growth	no algae	overabundant algal growth
Animal life	abundant	few	none
Bacteria iron in stream bed	none	moderate	over abundant
Litter	none	small amount	very common
Human impacts in stream	little seems natural	moderate, some evidence of change	major - dams, pipes, road culverts, etc.

Form #3
Monroe County Community Water Watch

Visual Survey

_____

Name of Stream **Location of Segment** **Monitoring Site #1 or #2**

_____

Individual or Group **Members present**

_____

Date **Time**

==========

Weather Conditions

Clear: _____ Cloudy: _____ Rain: _____ Rain or snow within last 24 to 48 hours? _____
Snow: _____ Water Temperature: _____ (°C/°F) Air Temperature: _____ (°C/°F)

Water flow (relative to the season):

High: ____ Normal: ____ Low: _____ Number of pools (per 75'): ____ Number of riffles (per 75'): ____
Stream Width: _____ Stream Depth Measurements: _____ _____ _____ _____ _____ Average Stream Depth _____ (feet)

Distance traveled by float device (feet)	Time (seconds)	Velocity (feet/seconds)
_____	_____	_____
_____	_____	_____
_____	_____	_____
		_____ (average Velocity feet/seconds)

Stream flow volume (SFV) = average stream depth (feet) x stream width (feet) x average stream velocity (feet/second)
SFV (cubic feet per second): _____

Water Appearance:		**Odor:**	
Clear	Milky/gray	None	Rotten egg
Muddy	Green	Natural	Sewage
Oily	Brown	Gasoline or oil	Chemical
Foamy	Black	Chlorine	Other _____
Scum	Other _____		

Habitat Description (For each of the categories listed in the chart on the reverse side, please circle the appropriate condition. Summarize your observations below.)

	Excellent	**Good**	**Fair**	**Poor**
Stream Bed	_____	_____	_____	_____
Sediment Deposits	_____	_____	_____	_____
Streambank Stability	_____	_____	_____	_____
Streambank Cover	_____	_____	_____	_____

Algae appearance:	**Algae located:**
____ Light green	____ Not present
____ Dark green	____ In spots
____ Brown coated	____ Attached
____ Matted on stream bed	____ Everywhere
____ Hairy	____ Floating

Wildlife? How much/What kind? _____

Evidence of pollution? How much/what kind? _____

Chemical monitoring data (optional): Dissolved Oxygen _____ (mg/L); pH _____; Conductivity _____ uS/cm

Category	Excellent Condition	Good Condition	Fair Condition	Poor Condition
Stream Bed	More than 50% rocks, logs, vegetation, undercut banks or other stable habitat.	50% to 30% rocks, logs, vegetation, or undercut banks. Adequate habitat for fish and aquatic insects.	30% to 10% rocks, logs, vegetation, or undercut banks. Less than desirable habitat for fish and aquatic insects.	Less than 10% rocks, logs, vegetation or undercut banks. Obvious lack of habitat for fish and aquatic insects.
Sediment Deposits	Little or no sediment deposits. Less than 5% of stream bed has sediment.	Some sediment deposits, mostly in pools. 5% to 30% of stream bed has sediment.	Moderate sediment deposits. 30% to 50% of stream bed has sediment.	Heavy deposits of sediment. More than 50% of stream bed has sediment.
Streambank Stability	Stable. No evidence of erosion.	Moderately stable. Only small areas of erosion.	Moderately unstable. Up to 60% of banks have evidence of erosion.	Unstable. 60% to 100% of banks have evidence of erosion.
Streambank Cover	More than 80% of streambank covered with vegetation, rocks and other stable material.	80% to 50% of streambank covered with vegetation, rocks and other stable material.	50% to 25% of streambank covered with vegetation, rocks and other stable material.	Less than 25% of streambank covered with vegetation, rocks and other stable material.

Please submit your completed form to:

Community Water Watch Program
c/o Margaret Cleary
Monroe County Health Department
PO Box 92832
Rochester, New York 14692-8932

Form #4
Monroe County Community Water Watch

Macroinvertebrate Data - Percent Model Affinity Method

Your team is asked to analyze benthic macroinvertebrates using the "Percent Model Affinity Method," at both of your monitoring sites, once each season. Please perform your analysis at the same time and locations as your visual surveys. Follow the instructions provided in the "Participants Manual."

Team Name: _____

Team Members Present: _____

Stream Name: _____

Monitoring Site (#1 or #2): _____

Date: _____

Group	Common Name	% (#) in Sample	Model %	Lesser Value
Oligochaeta	worms		5	
Ephemeroptera	mayflies		40	
Plecoptera	stoneflies		5	
Coleoptera	beetles		10	
Trichoptera	caddisflies		10	
Chironomidae	midges		20	
Other	other		10	
Totals		**100**	**100**	

Water Quality Impact:

_____ Severe (≤34)
_____ Moderate (35-49)
_____ Slight (50-64)
_____ None (≥65)

Please submit completed form to:
Community Water Watch Program
c/o Margaret Cleary
Monroe County Health Department
PO Box 92832
Rochester, New York 14692-8932

Form #6

Monroe County Community Water Watch

Team Leader Annual Report

Name of Group: _____ Date:_____

Team Leader: _____

Team Members: _____

Stream Name: _____

Stream Segment Location: _____

Monitoring Site (#1 or #2): _____

Annual Watershed Walk: (Date:) Assessment: Excellent ____ Fair ____ Poor: _____ Summary statement:

Visual Survey/Benthic Macroinvertebrate Data:

Date:	Date:	Date:	Date:
Water Flow: Depth = Width =	Water Flow: Depth = Width =	Water Flow: Depth = Width =	Water Flow: Depth = Width =
Appearance	Appearance	Appearance	Appearance
Habitat Description	Habitat Description	Habitat Description	Habitat Description
Algae:	Algae:	Algae:	Algae:
Pollution evidence:	Pollution evidence:	Pollution evidence:	Pollution evidence:
Trash (specify):	Trash (specify):	Trash (specify):	Trash (specify):
H2O Quality Impact1:	H2O Quality Impact:	H2O Quality Impact:	H2O Quality Impact:
Other Observations:	Other Observations:	Other Observations:	Other Observations:

Survey summary statement:

Optional Activities Completed:

Please submit completed form to:

Community Water Watch Program
c/o Margaret Cleary
Monroe County Health Department
P.O. Box 92832
Rochester, NY 14692-8932

1 Refer to the bottom of your completed Form #4 "Macroinvertebrate Data"