Streamlines

Newsletter of the New Hampshire Volunteer River Assessment Program **June 2006**

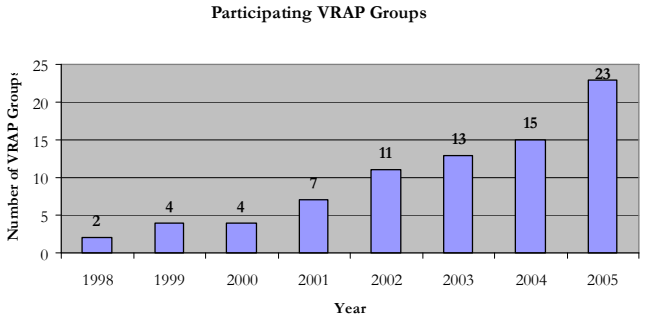
New Hampshire Department of Environmental Services Watershed Management Bureau

Welcome!

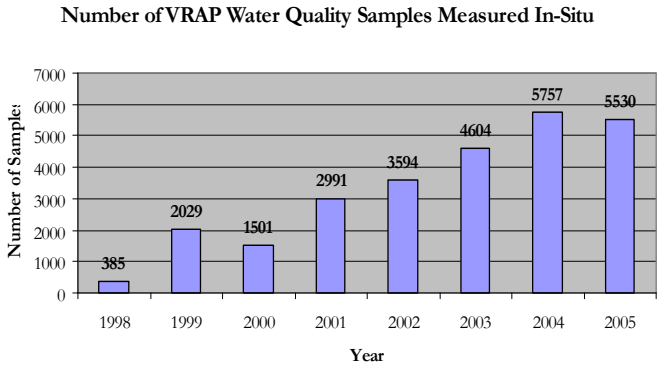
Welcome to the inaugural edition of *Streamlines*, the newsletter of the New Hampshire Volunteer River Assessment Program (VRAP). The newsletter will provide VRAP volunteers with programmatic updates, highlight the endeavors of VRAP's volunteer groups, and provide information on water quality monitoring and ecology of our streams and rivers.

VRAP was established in 1998 as a means of expanding awareness and education of maintaining water quality in rivers and streams in New Hampshire. VRAP was created in the wake of the success of the existing New Hampshire Volunteer Lake Assessment Program, which provides educational and stewardship opportunities pertaining to lakes and ponds in New Hampshire.

Today, VRAP continues to serve the public by loaning water quality monitoring equipment, technical support, and providing educational programs. Since its inception eight years ago, VRAP has grown to support **over 25 volunteer groups** on numerous rivers and watersheds throughout the state. These volunteer groups conduct water quality monitoring on an ongoing basis. The work of VRAP volunteers increases the amount of river water quality data available to local, state and federal governments, which allows for effective financial resource allocation and planning.



The number of water quality samples measured in the field has also grown significantly over the last eight years from 385 samples in 1998 to **5,530 in 2005**. Keep in mind, these figures only include parameters such as dissolved oxygen (mg/L and percent saturation), conductivity, pH, turbidity, and water/air temperature, and do not include samples analyzed in the laboratory such as nutrients (phosphorus, nitrogen), bacteria/E. coli, chloride, metals, etc. which would increase the total number of VRAP samples to **28,794**. And by adding data-logger measurements would increase the sample number by another 4,848 measurements to total **33,642**!



We hope that you enjoy *Streamlines*. Should you have any comments, suggestions, or topics you would like to see included in the next issue, please feel free to contact us.

Sincerely,

Jen Drociak, Ted Walsh, and Katie Zink

A Look Inside this Issue:

- Meet the Volunteer River Assessment Program Staff…….3
- 2006 Annual VRAP Refresher Training Workshops in Review……..4
- Reflections of a First-Year VRAP Group……..……..…5
- A Look at Hodgson Brook, Portsmouth…….……...….6
- Cocheco River Watershed Council Looks at Living Indicators…….……..…….7
- Cold River Local Advisory Committee Enters Fourth Year of Water Quality Characterization Project…….….8
- VRAP Monitors Help Assess NH's Streams and Rivers……9
- NHVLAP: Protect Your River by Monitoring Lakes and Ponds……..11
- As the River Flows, So Too Do Exotics……..……..12
- Looking for Local Funding to Support Your VRAP Group?.....13
- New VRAP Publications……..……14
- New VRAP Web Pages……..……...15
- VRAP Sampling Tips……..……..15
- Thank-You to All 2005 VRAP Volunteers……..……..16

Important Contacts for VRAP Volunteers

- **Steve Couture**
  Rivers Management Protection Program 271-8801 scouture@des.state.nh.us
- **Jen Drociak**
  VRAP Coordinator 271-0069 jdrociak@des.state.nh.us
- **Ken Edwardson**
  Water Quality Assessment Program 271-8864 kedwardson@des.state.nh.us
- **Andrea LaMoreaux**
  VLAP Coordinator 271-2658 alamoreaux@des.state.nh.us
- **Jeff Marcoux**
  Watershed Assistance Specialist 271-8862 jmarcoux@des.state.nh.us
- **David Neils**
  Biomonitoring Program Coordinator 271-8865 dneils@des.state.nh.us
- **Paul Piszczek**
  River Water Quality 271-2471 ppiszczek@des.state.nh.us
- **Amy Smagula**
  Exotic Species Coordinator 271-2248 asmagula@des.state.nh.us
- **Ted Walsh**
  VRAP Water Quality Specialist 271-2083 ewalsh@des.state.nh.us
- **Katie Zink**
  VRAP Assistant 271-8178 kzink@des.state.nh.us

Streamlines is published by

Jen Drociak
Editor and
Volunteer River Assessment
Program Coordinator

Ted Walsh
Water Quality Specialist

Katie Zink
VRAP Assistant

Watershed Management Bureau
New Hampshire Volunteer River
Assessment Program

29 Hazen Drive
PO Box 95
Concord, NH 03302-0095
(603) 271-0699

www.des.nh.gov/wmb/vrap

Meet the Volunteer River Assessment Program Staff

Jen Drociak

I began working for VRAP in November of 2005. For four years prior to VRAP, I coordinated the "Marsh Monitors" Volunteer Salt Marsh Monitoring Program for the New Hampshire Coastal Program (also at NHDES). I coordinated vegetative and fish surveys and water quality monitoring at salt marshes along the coast and Great Bay, during either pre- or post-restoration status.

From 1997-1999 I interned for the NHDES Volunteer Lake Assessment Program, Shoreland Protection Program, and Exotic Species Program. At the University of New Hampshire, I worked for the Lakes Lay Monitoring Program primarily performing freshwater algal identification/counts from lakes all over the state. From 1999-2000 I worked for both the Audubon Society of New Hampshire and the Merrimack River Watershed Council as an environmental educator. And from 2001-2002 I worked for NHDES Pollution Prevention Program providing outreach and technical assistance to marinas and municipalities.

From 2000-2005, as a member of the Manchester Conservation Commission, I advised the Manchester Urban Ponds Restoration Program and organized water quality sampling, assisted with the planning and implementation of best management practices, organized outreach/education events and endeavors, and twice-yearly pond cleanups at seven ponds within the city. I've also been a member of the NH Lakes Association's outreach/education committee since 2002.

I graduated from UNH with a bachelor of science degree in environmental science and a concentration in freshwater ecology. Since then, I completed a graduate class at UNH in lakes management, and plan on enrolling in additional classes in aquatic ecology and botany.

In my spare time enjoy gardening and landscaping, cooking, reading and writing poetry, pottery, photography, hiking, paddling, swimming, mucking in wetlands, and adding to my herbarium

Ted Walsh

For the past four year I have worked with the Volunteer River Assessment Program and have watched the program almost triple in size. VRAP continues to expand both in terms of the number of groups participating but also in the complexity of the monitoring that is being conducted. I look forward to continuing my work with VRAP and continuing to explore new opportunities to partner with volunteers.

Prior to my time at NHDES, I worked for six years in the office of the Governor Shaheen as Director of Citizen Affairs with a focus on natural resource issues and public outreach. I have also worked as a forester for Yale University and an assistant wildlife biologist for the Wildlife Habitat Council. I have a bachelor of arts degree from Colby College in environmental science and political science and a master of forestry degree from Yale University.

Katie Zink

I began working for VRAP in May of 2005 after graduating from Plymouth State University with an interdisciplinary degree in biology and geography. You may have met me last spring during the annual VRAP training workshops or in the field during the summer. Throughout last summer I spent most of my time deploying in-situ data-loggers and entering the data that you collected into the NHDES Environmental Monitoring Database. In September of 2005 I split my time between VRAP and the Volunteer Biomonitoring Assessment Program where I worked with the Cocheco River Watershed Coalition volunteers monitoring macroinvertebrates. In January of 2006, I returned to VRAP to assist in writing the 2005 VRAP water quality reports. In my spare time I love to take nature hikes and kayak. I especially enjoy winter sports like skiing and snowshoeing. In the future I hope to work in natural resource management. I look forward to working with you again during the summer of 2006!

2006 Annual VRAP Refresher Training Workshops In Review

By: Jen Drociak, VRAP Coordinator

During April and May, VRAP organized 11 annual training workshops. Training workshops were held in New Boston, Meredith, Goshen, Keene, Littleton, Madbury, Bethel Maine, Epping, Bennington, Nashua, and Portsmouth. Nineteen VRAP groups and **141** volunteers attended the events. Topics included:

- Calibration and meter checks;
- Quality assurance and quality control;
- Sample collection for field and laboratory analysis;
- Order of field tests;
- Sampling techniques (bridge and off-shore sampling);
- Water quality parameters and state standards; and
- Water quality monitoring equipment calibration and sampling techniques.

Each VRAP group was given a bound copy of "Water Quality Monitoring Field Sampling Protocols for Volunteer Monitors" and a laminated copy of "VRAP Water Quality Standards/Water Sampling Conversion Chart for Temperature" for their kit, and several copies of the 2006 Field Data Sheet. Each attendee was given a copy of the protocols, the 2006 field data sheet, Interpreting VRAP Water Quality Parameters fact-sheet, and a glossary of river ecology terms.

We hope that these annual VRAP refresher training workshops and handouts were helpful to both the group leaders and other volunteers. Remember to schedule an annual field visit with VRAP personnel. We look forward to seeing you in the field this summer!

Volunteers from the Israel River VRAP Group on their first monitoring event of the 2006 season.

Have You Scheduled an Annual Field Visit with VRAP Personnel?

Contact the VRAP Staff Today!

Jen Drociak
(603) 271-0699
jdrociak@des.state.nh.us

Ted Walsh
(603) 271-2083
ewalsh@des.state.nh.us

Katie Zink
(603) 271-8178
kzink@des.state.nh.us

Reflections of a First Year VRAP Group: Israel River

By: Bob Ball, Israel River Volunteer Advisory Group Coordinator, Jefferson NH

A conversation last autumn with a good friend turned into a discussion of what we had done over the summer. I mentioned that I had become involved in a river monitoring program on the Israel River. I could tell he wanted to ask why in the world I would do that.

So I started thinking, what motivated me to become involved in river monitoring through VRAP? The answer is complex. Something had attracted me to this river and I wanted to know more about it. By some means I had "connected" to the river and wanted to do something to help it. But what was it that got me involved?

My first thought was maybe it was the shear beauty of it all. The Israel River is nearly 25 miles long. It runs from high in the Presidential Range in Randolph and drops 3,000 feet in elevation until it enters the Connecticut River in Lancaster. Standing in the middle of a clear mountain stream with the Presidential Range as a backdrop can be an exuberating experience. There is also a variety of ecosystems. The Israel River runs through open meadows and dense softwood forests. It can be a calm, peaceful stream during the summer, or a roaring force during the spring when it floats large ice jams along its banks.

Then again, maybe it was the wildlife. I fish the Israel River often and remember my first experience in waders during a mayfly hatch, watching the trout rise around me. It is not unusual to see bear or moose tracks along its banks. Many birds use the river as a natural migratory route out of the Connecticut River valley. There are also beaver, mink and otter.

Or, maybe it is in the history. I really enjoy local history and have found that the Israel, like many rivers, has been a central part of community development. I was intrigued to learn that 11,000 years ago the Paleo Indians used this river as a major corridor in their travels east from the Connecticut River. No, that is not a typo, it was in prehistoric times, 11,000 years ago! Some of the early Jefferson maps show the river as the Swoogonock, as it was called by the Native Americans, who used it extensively in their travels. When the early English settlers arrived, they renamed it for an early explorer, Israel Glines who fished and trapped the river. Some of the river signs in Jefferson still call it Israel's river. I wish I could have witnessed one of the early nineteenth century anadromous fish migrations. Without them, the early settlers might not have survived. Even in more recent times, it is interesting to hear stories from long-term residents who talk about President Ike Eisenhower fly-fishing the Israel River in the 1950s. The Secret Service personnel surely must have had a pleasant experience on those days.

For whatever the reason I connected to this river, I have found that I am not alone. The river brings out new dimensions in people. The newly formed Israel River Volunteer Advisory Group quickly grew to 16 people in the first year. People who have helped all seem to have a personal connection to the river.

While it is good to think of the more intangible things that attract us to a river, the reality is that it takes more concrete, tangible data to manage the future. Planning and prioritization of resources requires a solid baseline of water quality data. I feel fortunate that VRAP has provided procedures, training, equipment, and experts to assist with our effort.

The Israel River Volunteer Advisory Group conducted four monitoring sessions in 2005 at eight stations on the Israel River. To the best of our knowledge, this is the first significant water quality monitoring to be done on this river. Our initial water quality results look very good and within state water quality standards. But we know that it will take more years before we can determine trends.

Peg Fischang, Bill Fischang, and Winnie Ward gear up for a day of sampling on the Israel River.

When I look at the multi-year VRAP data from some of the other groups in the program, I am impressed by the amount of volunteer effort expended for our rivers. Something must have "connected" these volunteers to their local river and motivated them. Maybe it was same things that attracted me to the Israel. Whatever it was, I hope it continues. Our rivers deserve the attention.

A Look at Hodgson Brook, Portsmouth NH

By: Sherry Godlewski, Hodgson Brook Watershed Coordinator and Natalie Landry, NHDES Coastal Watershed Supervisor

Hodgson Brook is a small freshwater brook that flows for seven miles through the heart of Portsmouth. It starts in the Pease International Tradeport, travels under the Portsmouth traffic circle and continues easterly to North Mill Pond, which empties into the Piscataqua River. Many people have never heard of it because over time, local land uses and urbanization have degraded the brook's physical, chemical and biological state. In many places the brook is hidden from public view and enjoyment due to development and restricted access. Because of the Brook's pollution problems and low visibility, it has been largely ignored, neglected, and forgotten.

The Hodgson Brook watershed is over 2,000 acres taking up 20 percent of the city of Portsmouth. Fifty-five percent of the watershed is within the Pease International Tradeport and over 33 percent of the watershed is covered with impervious surfaces. This urbanized watershed conveys a lot of stormwater off the Tradeport, the traffic circle, and the highways. The brook is the primary source of freshwater coming into the tidally influenced North Mill Pond. Because it carries so much stormwater, and the pollutants that are part of stormwater, it is causing problems in North Mill Pond. The state lists the pond as too polluted for swimming or shellfish harvesting. A local organization, the Advocates for the North Mill Pond (ANMP), conducted a comprehensive study of water and environmental quality in 1998. Based on this study and the regular sampling of the brook, it became clear to the ANMP that in order for the environmental quality of the North Mill Pond to improve, the quality of Hodgson Brook must be restored.

The Hodgson Brook Advisory Board (originally called the Hodgson Brook Local Advisory Committee) was formed in 2002 in response to questions about the impact the brook might be having on the water quality of North Mill Pond. Last year, volunteers began monitoring seven main stem and tributary stations under the guidance of the Volunteer River Assessment Program. The Hodgson Brook Advisory Board's (HBAB) goal is to restore the brook and meet state water quality standards by 2014. Currently, the brook fails to meet many state standards because of high bacteria levels and damage to the in-stream habitat.

The HBAB has many goals as described in their 2004 watershed management plan. The Hodgson Brook Coordinator, Sherry Godlewski, is working with the Advisory Board and other volunteers in the watershed to reach these goals that address water quality as mentioned above, stormwater impacts, riparian buffers and instream habitat. We are also working hard to spread the good word about the brook and all that it has to offer to those living and working in the watershed.

Sherry Godlweski and Ted Walsh install a staff gauge at Hodgson Brook.

Working with VRAP has been a perfect way to move forward with the goals of the project. VRAP has given HBAB the framework in which to operate and has set the foundation for gathering data, upon which decisions can be made. In addition to the traditional VRAP parameters, Hodgson Brook is monitored for *E. coli* bacteria and chloride. A data-logger was deployed last fall and caught a big storm. The information collected by the data-logger from the 24-hour cycles was an excellent addition to the ambient parameters collected during the field season. VRAP staff has also provided guidance for the installation of a staff gauge to assist in determining stream flow volumes and pollutant loading. VRAP staff has always been helpful with questions and ideas. They are sure to make at least an annual visit and will do more if needed. Participating in VRAP is beneficial and most of all fun!

For more information, contact Sherry Godlewski at (603) 559-1529 or hodgsonbrook@blueoceansociety.org or visit www.nh.gov/hodgsonbrook/

Cocheco River Watershed Council Looks at Living Indicators

By: Cathy Coletti, New Hampshire Coastal Program and Katie Zink, VRAP Assistant

The Cocheco River Watershed Coalition in cooperation with the NHDES Coastal and Biomonitoring Programs launched a new monitoring project during the summer/fall of 2005 at nine stations along the Cocheco River and six of its tributaries. They were looking for benthic macroinvertebrates; living organisms without a backbone that can be seen with the naked eye. What some people would simply call *bugs* the CRWC now fondly call trichoptera, or megaloptera.

Lorie Chase, CRWC program coordinator, and Cal Schroeder, CRWC chair, envisioned a project where volunteers could learn while contributing to the knowledge base of the Cocheco River Watershed. CRWC continues to collect chemical water quality data through VRAP but up until last year had not looked at biological indicators.

In September, CRWC volunteers collected macroinvertebrates using kick nets at nine stations, most of them in Rochester and Farmington on the Cocheco, Isinglass, Rattlesnake, Kicking Horse, Ax Handle, Fresh Creek and Ela Rivers. Volunteers identified specimens while in the field. They also collected specimens from three additional sites using rock baskets, which are wire enclosures that contain rocks and create macroinvertebrate habitat. Rock baskets were deployed in July and collected in September. Specimens from the rock baskets were preserved and taken to the NHDES lab for identification to the genus and species level.

Volunteers learned to identify 19 organisms to order level. Between the nine stations that were sampled, all 19 organisms were found. Streamside evaluations took approximately one to two hours with two to three volunteers picking macroinvertebrates out of a sample. A running tally was kept to determine the amount of tolerant and intolerant species living in the watershed. "A good mix is what we are looking for," said Dave Neils, NHDES aquatic biologist. "Some species that are tolerant to pollution won't hurt the community; its good to see a variety."

Tolerant macroinvertebrates can thrive in polluted conditions while the intolerant are more sensitive. For example, mayflies, stoneflies and caddisflies struggle to survive in polluted waters, while midges and aquatic worms are often found in these conditions.

There are three categories for biotic river assessments: excellent, good, and fairly poor. Each has a water quality score that is calculated using a tolerance value assigned to each invertebrate. Clams, scuds and aquatic worms have high tolerance values since they can survive with some pollutants and low dissolved oxygen. Mayflies, stoneflies and hellgrammites are more readily found in areas with low pollutant loads and therefore have a lower tolerance value.

David Neils, foreground, and Lisa Farley, background, demonstrate how to retrieve rock baskets.

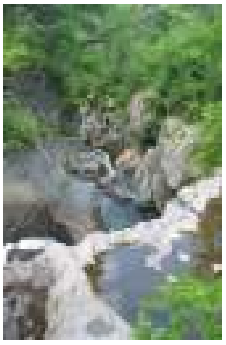
Volunteers discovered that the Cocheco River and its tributaries provided mostly "good" habitat for these benthic species, and only one site had a "fairly poor" rating.

Biomonitoring and chemical monitoring complement each other in understanding water quality. Biomonitoring incorporates the cumulative effects of water pollution while the results of a single water sample are limited to that specific date and time. In other words, macroinvertebrates can tell the story. Chemical properties can be sensitive to changing conditions, like intermittent discharges or periodic storm events, according to David Neils.

NHDES has completed a report that combines its data on biological health with physical and chemical characteristics and presented the project results to the public in March. The report can be viewed by visiting www.des.nh.gov/wmb/.

Cold River Local Advisory Committee Enters Fourth Year of Water Quality Characterization Project

By: Mike Heidorn, Cold River Local Advisory Committee's Water Quality Sampling Coordinator



The Cold River Local Advisory Committee is completing a multi-year water quality characterization project that includes physical, chemical and biological monitoring of the Cold River, its tributaries and other water resources. The CRLAC has been an active participant in VRAP since 2002.

The Cold River watershed is recognized both regionally and nationally for its natural, cultural, scenic and scientific values, and particularly its outstanding wildlife habitat and plant communities. The watershed includes the towns of Alstead, Acworth, Walpole, Langdon, Lempster, Charlestown, Marlow and Unity.

The current monitoring program focuses on assessing surface water quality and flow by developing a comprehensive long-term database of representative measurements at 28 stations in the watershed. We measure dissolved oxygen, pH, conductivity, temperature, turbidity, nutrients (nitrogen and phosphorous), bacteria, chloride, stream stage, velocity and aquatic insect populations. The results to date suggest that water quality in the Cold River and its tributaries is generally good to excellent but occasionally poor. Areas of concern include pH, turbidity, temperature, phosphorous, aluminum and bacteria.

Our program is greatly enhanced through the use of a submersible water quality data-logger. Field measurements are made quickly and accurately, enabling us to tackle a large number of stations with relatively few volunteers. All field measurements are instantly saved to a hand-held computer for improved consistency and quality control. Data-logging capabilities allow us to watch for water quality changes due to storm events and to profile ponds and impoundments from a boat.

The submersible data-logger, as well as a velocity probe and a weather-logger, have all been purchased and maintained as a result of a large grassroots fundraising effort completed by CRLAC in 2003. Laboratory costs have been partially covered by those funds, and partially covered through VRAP assistance. Continuation of the project will likely require additional fund-raising efforts, so we will be examining possible approaches and options over the coming year.

Volunteer recruitment and retention has been difficult but continually improving. By streamlining the sampling program last year, we saw increased participation. We also worked with students from Fall Mountain High School, Keene High School and Antioch New England Graduate School, which provided an excellent variety of fresh perspectives. This year we hope to capitalize on last year's success and stimulate additional interest by handing out fact sheets about the program to local boards and residents.

Over the coming year, project leaders will continue to strive for improved communications between local schools, municipal officials, lake associations and landowners on water resource issues. For example, the CRLAC, NHDES, Fish & Game, and a VLAP volunteer recently met to discuss possible improvements to the sharing of sampling information and synchronization of sampling events and locations. A major goal of these improvements would be to examine the impacts of the October 2005 flood on the Cold River and Warren Brook.

CRLAC is planning to participate again this year in a NHDES pilot study assessing the feasibility of volunteer flow monitoring. Last year's efforts at the Drewsville Gorge site indicated that such monitoring was feasible and accurate. Our long-term goal is to re-institute flow monitoring at this historic (and currently defunct) U.S. Geological Survey gauging station, which has decades of supporting data and a stable river profile.

Additional information can be found in the *2005 VRAP Cold River Water Quality Report* or the CRLAC water quality fact sheet. Project updates are provided at CRLAC meetings held on the fourth Thursday of each month from 7 – 9 p.m., at the Alstead Town Office. The CRLAC's Water Quality Sampling Coordinator can be reached at (603) 835-2328 or heidorn1@sover.net.

VRAP Monitors Help NHDES Assess NH's Streams & Rivers

By: Gregg Comstock and Ken Edwardson, NHDES Watershed Management Bureau

On March 31, 2006, the NHDES Watershed Management Bureau submitted the 2006 Section 305(b) and 303(d) Surface Water Quality Report for New Hampshire to the EPA. The 2006, 303(d) list and the Consolidated Assessment and Listing Methodology are available at www.des.nh.gov/wmb/swqa. It is expected that the complete Section 305(b) Report will be available in on the web in shortly.

What is a Section 305(b)/303(d) Report?

Every two years, the federal Clean Water Act (CWA) requires states to submit two surface water quality documents to the U.S. Environmental Protection Agency. Section 305(b) of the CWA requires submittal of a report, commonly called the "305(b) Report", that describes the quality of the surface waters and an analysis of the extent to which all such waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water.

The second document is typically called the "303(d) List" because it is a required by Section 303(d) of the CWA. The 303(d) list includes all surface waters that

- Are impaired or threatened by a pollutant or pollutant(s);
- Are not expected to meet water quality standards even after application of best technology standards for point sources or best management practices for nonpoint sources and;
- Require development of comprehensive water quality studies called Total Maximum Daily Load (TMDL) studies.

How Water Quality Assessments are Conducted?

How do we determine if a waterbody is healthy (i.e. fully supporting), impaired (i.e. not supporting), threatened, or if there is insufficient information to make an assessment? Answers to these questions and many more questions may be found in the Consolidated Assessment and Listing Methodology, (CALM), which is available at http://www.nh.gov/WMB/swqa/2004/pdf/CALM.pdf. In general the CALM is the translator for how the water quality data will be used to make surface water quality attainment decisions by designated use (aquatic life, swimming, …) consistent with state surface water quality standards, RSA 485-A:8 and Env-Ws 1700.

What are Assessment Units?

Assessment units are the basic unit of record for conducting and reporting water quality assessments. In 2002, all surface waters in New Hampshire were subdivided into approximately 5,100 assessment units. The system is based on 1:100,000 scale hydrography that is linked to the National Hydrography Dataset, the national coverage used by EPA. In the future, DES intends to move to higher resolution (1:24,000 scale) hydrography, which will result in even more accurate assessments.

What's New for 2006?

For the 2002 and 2004 assessments NHDES has relied upon EPA's Assessment Database (E-ADB) to track and relay assessment information. EPA's ADB is designed to track water quality assessment data, including use attainment, and causes and sources of impairment. However the ADB is limited as water quality management tool as it only tracks parameters that are impaired. New Hampshire needed a tool that tracks the assessment status of all parameters to facilitate identification of impaired waters as well as to assess data gaps. Additionally, we wanted to be able to report at the assessment unit level the degree of support or non-support of a parameter and in cases where there is insufficient information for a parameter to draw a firm conclusion, answer the question of what the available data suggests. To that end, NHDES created a new supplemental assessment database.

As the 2006 assessment website gets set up we anticipate that a NHDES category as described in Table 1 will be available for every parameter on every assessment in the state.

Table 1. Availability of Parameter Level Assessment Information, 2006 Verses 2004

NHDES Category as reported in 2006	2006, NHDES Category Description	As Reported in 2004
2-G	All samples for a given parameter meet water quality standards (WQS) by a relatively large margin. (i.e., good (G) condition)	Not Reported
2-M	Samples for a given parameter meet water quality standards but only marginally (M).	Not Reported
2-OBS	Parameter exceeds numeric water quality criteria (WQC) but the exceedance is due to natural conditions. Natural exceedances are not considered violations of WQS and are instead categorized as observed effects (OBS). .	Not Reported.
3-ND	There is no data (ND) available to make an assessment..	Not Reported.
3-PAS	There is some data but it is insufficient data to assess the parameter per the CALM, however, the data that is available suggests that the parameter is Potentially Attaining Standards (PAS)	Not Reported
3-PNS	There is some data but it is insufficient data to assess the parameter per the CALM, however, the data that is available suggests that the parameter is Potentially Not Supporting (PNS) water quality standards (e.g., there is one exceedance).	Not Reported
4A-M	The parameter is a pollutant which is assessed as an impairment per the CALM, and an EPA-approved TMDL has been completed. However, the impairment is relatively slight or marginal (M)	Only reported 4A (no marginal (M) sub-category)
4A-P	The parameter is a pollutant which is assessed as an impairment per the CALM, and an EPA-approved TMDL has been completed. However, the impairment is more severe and causes poor (P) water quality conditions	Only reported 4A (no marginal (P) sub-category)
4B-M	Parameter is a pollutant that is causing impairment as per the CALM but a TMDL is not necessary since other controls are expected to attain water quality standards within a reasonable time. The impairment is marginal (M).	Only reported 4B (no marginal (M) sub-category)
4B-P	Parameter is a pollutant that is causing impairment as per the CALM but a TMDL is not necessary since other controls are expected to attain water quality standards within a reasonable time. The impairment is more severe and causes poor (P) water quality	Only reported 4B (no poor (P) sub-category)
4B-T	Parameter is a pollutant that appears to currently meet WQS but is threatening (T) impairment as per the CALM but a TMDL is not necessary since other controls are expected to attain water quality standards within a reasonable time.	Only reported 4B (no threatened (T) sub-category)
4C-M	Parameter is not a pollutant but is causing impairment per the CALM. The impairment is marginal (M) as defined in DES sub-category 4A-M above.	Only reported 4C (no marginal (M) sub-category)
4C-P	Parameter is not a pollutant but is causing impairment per the CALM. The impairment is more severe and causes poor (P) water quality as defined in DES sub-category 4A-P above.	Only reported 4C (no poor (P) sub-category
5-M	Parameter is a pollutant that requires a TMDL (303(d)). The impairment is marginal (M) as defined in DES sub-category 4A-M above.	Only reported 5 (no marginal (M) sub-category)
5-P	Parameter is a pollutant that requires a TMDL (303(d)). The impairment is more severe and causes poor (P) water quality as defined in DES sub-category 4A-P above.	Only reported 5 (no poor (P) sub-category
5-T	Parameter is a pollutant that requires a TMDL (303(d)). The pollutant appears to currently meet water quality standards but is threatening (T) impairment per the CALM.	Only reported 5 (no threatened (T) sub-category

Is Volunteer Data Used?

As long as the quality assurance/quality control measures result in data of adequate quality, we can and do use it in the assessments. The 2006 assessments of riverine assessment units include over 53,000 water quality standard comparisons of which nearly 60 percent came from volunteer sampling efforts. Thanks to this volunteer data contributed to the assessment of 1,820 miles of rivers and streams on 489 riverine assessment units.

How You Can Help Improve Our Assessments?

Help us fill in the data gaps and maintain strong datasets on New Hampshire's rivers so that we can assess more of New Hampshire's surface waters in assessments to come. Considering the fact that as of 2006 there are approximately 5,200 assessment units statewide, it's not surprising that data gaps exist. Additionally, since riverine systems are so dynamic and our landscape is changing, only the most recent five years of data is usually used in a given assessment round. So, one way to help is to submit any surface water data you have to the NHDES Watershed Management Bureau along with QA/QC information. If it is of adequate quality, we can and will use it in our assessments. Information on how to submit data is available at www.nh.gov/wmb/swqa.

NHVLAP: Protect Your *RIVER* by Monitoring Lakes & Ponds

By: Andrea LaMoreaux, VLAP Coordinator

Is there a lake or pond within your watershed or an impoundment within your designated river corridor? Are you interested in finding out how healthy your lake/pond is, and what you can do to protect it as part of your efforts to protect and manage the outstanding resources and characteristics of your designated river? If you answered "yes" to these questions then you may be interested in joining the DES's Volunteer Lake Assessment Program!

What is NHVLAP?

VLAP was initiated in 1985 in response to an expressed desire of lake associations to be involved in lake protection and watershed management. VLAP is a cooperative program between watershed residents and the Watershed Management Bureau. VLAP encourages individuals and watershed associations to play an active role in monitoring and protecting the beauty and value of the lake/pond that they live near. By sampling the lake several times each year over a period of years, volunteer monitors help to develop a comprehensive data set from which long-term water quality trends can be discerned.

Routine volunteer monitoring results in early detection of water quality changes, allowing NHDES to trace potential problems to their source before the lake/pond and/or the river is severely impacted. In addition, monitoring data is used in the state's report to the Environmental Protection Agency for incorporation into the report to Congress that assesses the quality of the nation's waters.

Importance of Volunteer Monitoring

VLAP volunteer monitors have been, and will continue to be, a key element in protecting the integrity of New Hampshire's waterbodies. Volunteer monitoring leads to local awareness of land use and human practices that may be detrimental to lake quality and also empowers communities in their decision-making regarding lake management issues. Pollution prevention through routine volunteer monitoring ultimately saves the community and the state the cost of expensive, after-the-fact remediation. Maintaining clean water and quality lake resources benefits all of us.

Please Join!

Regardless of your interest in VLAP, whether it is to improve community planning decisions, to do your part in protecting the local environment, or to protect your own investment in property adjacent to the lake or river, please join our program to help keep New Hampshire's waterbodies healthy and clean. There is still time to join before the 2006 sampling season! For more information or to set up a training visit to your lake/pond, please contact Andrea LaMoreaux, VLAP Coordinator at (603) 271-2658 or alamoreaux@des.state.nh.us. For more information visit www.des.nh.gov/wmb/vlap.

VLAP Volunteers Don Flemming and Geoff Molina with secchi disk on Island Pond in Stoddard.

As the River Flows, So Too Do the Exotics

By: Amy Smagula, Exotic Species Coordinator/Limnologist

Yes, it is true. Exotic species have gained a foothold in many of New Hampshire's rivers and streams. You can find them submersed and waving in the currents of slow flowing water, forming emergent areas along the water's edge, and creating impenetrable thickets along the banks. Variable milfoil, fanwort, water chestnut, Eurasian water-milfoil, naiads, and curly-leaf pondweed are all different types of exotic aquatic plants that call various river segments home in New Hampshire.

Infestations in rivers can begin in various ways. In some cases, there is a lake or pond in the headwaters of the river that is infested, and the exotic aquatic plant can flow downstream from the infested waterbody into the river. In other cases, a boat or other piece of aquatic recreational gear (including fishing equipment) can be introduced into the river at a launch site or at another type of public access, bringing with it an exotic aquatic plant.

Once a plant makes it into the system, rivers, by their sheer nature, provide prime habitat for exotic species to take root. The flow of the system provides what is essentially a free ride for plant fragments and fruits from upstream areas to downstream portions of the river. The slow moving or backwater areas of the rivers provide an optimal area for these seeds and vegetative materials to settle and possibly take root. The organic substrates of most rivers provide a rich source of nutrients for the plants to grow. With the combination of these characteristics, it is no wonder that our river systems are realizing the problems that, for a while, were predominately known to only lake and pond habitats.

There are currently infestations documented in 10 rivers and streams throughout New Hampshire. Most only have one exotic aquatic plant that has taken root (most frequently variable milfoil), but some, like the Connecticut River and the Nashua River, have as many as four or five different exotic aquatic plants competing with one another. A map of exotic aquatic plant infestations can be found online at www.nh.gov/wmb/exoticspecies/milfoil_list.htm.

If your river is as of yet free from exotic aquatic plants, then your emphasis should be on prevention and early detection. Know your watershed and where the existing infestations are with relation to the river system. What are the hydrologic connections to these infested waterbodies, and can they lead to an infestation in the river? If yes, is there something that can be done (barriers, management upstream) to prevent the downstream migration of exotic species to your river? Do you have signage at all public access points on your river, be they drive-in launches, car top access sites, or designated fishing or swimming areas? If not, then contact the Exotic Species Program for free signs that can be displayed to educate users of the river. Do you have kiosks where you can post educational information about exotic species?

Variable milfoil in the Soucook River

You may also want to consider forming a Weed Watcher group on the river. This group can be trained on-site by the Exotic Species Program Coordinator to monitor for changing plant growth and exotic aquatic plants. Weed Watchers monitor their waterbodies once a month from May through September, when it is most likely that the plants will take root and cause a new infestation. With both prevention and early detection activities in place, it can be possible to slow the spread of the exotics, and to detect them early if they do become established.

If your river is currently infested, please don't throw up your arms in frustration. Yes, infested river systems are a challenge, particularly since most attempts at control are thwarted due to the flow of the system (dilution of herbicides, dispersion of seeds and fragments and subsequently larger scale infestations). Depending on the type and size of the infestation, the Exotic Species Program staff can work with you to try to contain the infestation and to minimize the impacts of the plant growth. Each infestation is handled on a case by case basis. It is, however, still important to remember that prevention and early detection actions, as described above, are still important since the possibility still exists for additional exotic aquatic plants to be introduced. The most important thing to remember is that if an infestation is found early, it can be controlled more easily, and the possibility for eradication can still exist.

There are approximately 11,000 miles of river and streams in New Hampshire, and by and large most of those miles are free from exotic aquatic plants. By working together to prevent new infestations, and to find any new infestations early, we can hopefully keep those beautiful miles of river free from exotics.

For more information please contact Amy Smagula at 271-2248 or asmagula@des.state.nh.us or visit www.des.nh.gov/wmb/exoticspecies.

Looking for Local Funding to Support Your VRAP Program?

By: Ted Walsh, Water Quality Specialist, Volunteer River Assessment Program

Since its inception in 1998, VRAP has grown from a handful of groups in the Seacoast area to now over 25 active groups throughout the state. Some VRAP groups are now entering their ninth year of monitoring and we continue to bring new groups to the program each year. Although we try to give financial support to as many groups as possible, the funds VRAP has available for laboratory services cannot always keep pace with the interest VRAP groups have in expanding their monitoring plans. A number of VRAP groups have also expressed interest in purchasing their own monitoring equipment to allow for more flexibility in when they monitor and to ease the logistics of sometimes having to share equipment with other groups.

A number of VRAP groups have had successes in seeking out and receiving funding to expand the number of parameters they are monitoring and to purchase their own equipment. I would like to share with you some of the methods VRAP groups have used to acquire funding and to offer up some additional suggestions:

- Contact town officials such as the board of selectman, planning board, and conservation commission, to educate them about the work you are doing to monitor and protect the town's natural resources. It currently costs approximately $2,000 to purchase a full VRAP field kit. This is a lot of money to a small watershed group or LAC, but for many towns it is a small and wise investment to receive valuable water quality information that could be very helpful in future planning efforts. A number of VRAP groups have received funding to purchase kits from their towns.

- If your VRAP group is not part of an official watershed association, organize a group of concerned property owners along the river to form an association. Watershed associations can serve several functions, including implementing membership dues that can be used towards paying for water quality sample analyses.

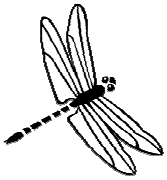
- If your VRAP group is part of a watershed association and currently relies on membership dues to subsidize your water quality sampling program, the association might want to consider slightly increasing membership dues for the specific purpose of enhancing the monitoring program and/or purchasing water quality monitoring equipment.

- Conduct an annual fundraiser to support your water quality testing program. Events such as "duck races" and paddling races are a great way to bring the community to the river and educated them about the work that is being done to protect our natural resources.

- Ask local businesses to "adopt" one of your water quality monitoring stations. By sponsoring one of the monitoring stations a business could cover the costs of laboratory tests and at the same time be recognized by the VRAP group for their commitment to preserving New Hampshire's rivers and streams.

- Invest in items such as T-shirts and tote bags that could be sold throughout the community both as a fundraising tool and as a means for educating the community about the existence of your watershed organization and the beauty of the rivers and stream in their community.

- Continue to seek out and apply for grant opportunities. A number of our current VRAP groups have been able to purchase water quality monitoring equipment with grant funds. NHDES will continue to alert VRAP groups when we see grant opportunities that would allow individual groups and the overall program to grow.



VRAP Publications

- **NH Volunteer River Assessment Program Water Quality Monitoring Field Sampling Protocols for Volunteer Monitors** *(Revised, April 2006)*

  This manual was created for VRAP volunteers as a reference guide to the use of water quality monitoring equipment provided by NHDES, proper calibration and sampling techniques, and quality assurance/quality control measures. To download a copy, please visit www.des.nh.gov/wmb/vrap/pdf/Protocols.pdf.

- **Interpreting VRAP Water Quality Parameters** *(Revised, December 2005)*

  This document discusses water quality parameters such as dissolved oxygen, pH, specific conductance, and turbidity and their importance to maintaining healthy aquatic ecosystems. To download a copy, please visit www.des.nh.gov/wmb/vrap/pdf/WQParams.pdf.

- **Glossary of River Ecology Terms** *(December 2005)*

  Looking for a definition to one of those pesky terms ecologists and water quality planners toss out? This document lists many in the categories of general ecology; river/stream morphology; water movement/flow; bottom type/substrate; habitats; life in flowing waters and vegetation. Copies available at www.des.nh.gov/wmb/vrap/pdf/Glossary_of_Riverine_Ecology_Terms.pdf

- **Floodplain Forest Communities in New Hampshire** *(January 2006)*
  Copies available at www.des.nh.gov/wmb/vrap/pdf/Floodplain_Forest_Communities.pdf

Other Publications

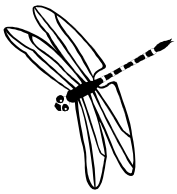
- **Native Shoreland/Riparian Buffer Plantings for New Hampshire** *(March 2006)*

  This document gives common name, Latin name, height, growth-rate, rooting, light-preference, soil-preference and associated birds and mammals (cover, nesting, or food) and food values for native trees, shrubs, and groundcover/herbaceous perennials that can be planted along the protected shoreland and riparian areas of New Hampshire. See
  www.des.nh.gov/WMB/VRAP/pdf/NativeShorelandRiparianBufferPlantingsNH.pdf

- **Effects of Urbanization on Stream Quality at Selected Sites in the Seacoast Region in New Hampshire, 2001-2003**

  The U.S. Geological Service and New Hampshire Coastal Program published this scientific investigation report, which includes results from a three-year cooperative study to determine if urban development affects water quality in New Hampshire's coastal watersheds. This study is unique because it provides scientific data about local watersheds and streams. Many studies in the past have been conducted at the national level. See http://pubs.usgs.gov/sir/2005/5103/SIR2005-5103_report.pdfpdf

For Young Naturalists



- **General Ecology Crossword Puzzle** *(December 2005)*
  http://www.des.nh.gov/wmb/vrap/pdf/VRAP_General_Ecology_Crossword_Puzzle.pdf

- **Life in Flowing Waters Crossword Puzzle** *(December 2005)*
  http://www.des.nh.gov/wmb/vrap/pdf/VRAP_Life_in_Flowing_Waters_Crossword_Puzzle.pdf

- **Stream Morphology Crossword Puzzle** *(December 2005)*
  http://www.des.nh.gov/wmb/vrap/pdf/VRAP_Stream_Morphology_Flow_Crossword_Puzzle.pdf

- **Water Cycle and Uses Word Find** *(December 2005)*
  http://www.des.nh.gov/wmb/vrap/pdf/VRAP_Water_Cycle_Uses_Word_Find.pdf

New VRAP Web Pages

We encourage you to visit the VRAP website at www.des.nh.gov/wmb/vrap where you will find these new pages:

- **Links of Interest:** Links to other relevant NHDES programs; local river management advisory committees; local watershed associations; regional planning commissions, state organizations; regional organizations; and national organizations; www.des.nh.gov/wmb/vrap/vrap.asp?theLink=links
- **Publications and Informational Resources:** Handbooks and field guides; field data sheets; reports, data and maps; newsletters; fact sheets; www.des.nh.gov/wmb/vrap/vrap.asp?theLink=info
- **Educational Resources:** Workshops, events, educational organization links. - www.des.nh.gov/wmb/vrap/vrap.asp?theLink=educ

VRAP Sampling Tips

- **Calibrate the pH and DO meters before each measurement!**
- **Do not turn off the DO meter until the end of the day!**
- **Run a replicate sample once a day!**
- **Test the pH 6.0 buffer, turbidity DI blank, and zero oxygen once a day!**
- **Check the conductivity meter with the 200 standard at the beginning & end of the day!**
- **Check the Turbidity Meter with the 1.0 NTU standard at the beginning and end of the day!**

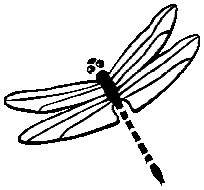
Staff from the Nashua Regional Planning Commission assist volunteers from the Pennichuck Brook VRAP Group during a sampling event.

"When you put your hand in a flowing stream, you touch the last that has gone before and the first of what is still to come."

- Leonardo da Vinci

"I've known rivers; I've known rivers ancient as the world and older than the flow of human blood in human veins. My soul has grown deep like the rivers."

- Langston Hughes



Thank-You to all 2005 VRAP Volunteers!

- **Ammonusuc River:** Ginny DiFrancesco, Evan Karpf, Joan Karpf, Ray Lobdell, and Woodsville Water & Light District
- **Ashuelot River:** Jim Beatty, Ken Cole, Pat Eggleston, Penny Eggleston, Geoff Gardner, Carol Glabach, Jim Holley, Bob Lamoy, Carolyn MacDonald, Malcom MacDonald, Linda McCracken, David Moon, John Parsons, Steve Poole, Barbara Skully, Jay Smeltz, Steve Stepenuck, Ann Sweet, Roger Sweet and Bob Thompson
- **Bellamy River:** Tom Cravens, Karen Diamond, Marci Erickson, Ric Erickson, Eric Fiegenbaum, Peter Keefe, Jim Leavenworth, Barbara Maurer, Craig Seaver, Pam Seaver and Don Sundberg
- **Cocheco River:** Lorie Chase, Barbara Dionne, Novella Dionne, Melodie A. Esterberg, David Green, Kristen Henderson, Bill Sammis, Cal Shroeder and Brian Stern
- **Cold River:** Kathy Harkay, Kristin Harkey, Mike Heidorn, Deb Hinman, Charlie Montgomery, Jen Polcari, Erik Walker, and Howard Weeks
- **Contoocook River:** Marion Baker, Dick Bell, Bob Carney, Beth Alpaugh-Cote, Rod Cyr, Michelle Hamm, Bob Henderson, Ted Hillson, Ron Roustadt, Cory Stephenson, Rod Twiner and Linda White
- **Gridley River:** Selinda Chiquoine, Karen DeBonis and Jon VanderHorst
- **Gunnison Brook/South Branch Sugar River Watershed:** Elaine Bevilacqua, Bob Blackwood, Gary Dennis, Dick Hamilton, Bea Jillette, Cyndi Phillips and Jessie Wilcox
- **Hodgson Brook:** Stephanie Fardy, Sherry Godlewski, Natalie Landry and Meryl Richards
- **Isinglass River:** Peter Keefe, Anne Melvin, Ann Schulz and Cyndi Twombly
- **Israel River:** Beth Ball, Bob Ball, Jenn Barton, Jean Cargill, Bob Christie, Ginny DiFrancesco, Bill Fischang, Peg Fischang, Dave Govatski, Bruce Kirmmse, Ray Lobdell, Charles Muller, Gary Newfield, Justin Preisendorfer and Winnie Ward
- **Lamprey River:** Celia Abrams, Sue Amacal, Dan Beck, Stephanie Beck, Kim Briggs, Sandy Cote, Paul Gallant, Catherine Gardner, Jim Gardner, Dawn Genes, Barry Kane, Deb Kimball, Dick Lord, Richard Lyons, Virginia Lyons, Maureen McGinty, Sue Mooney, Sandra Parker, Shirley Sauvageau, Kaya Sequeira, Kevin Sequeira, Carl Spang, Leo Smock-Randall and Peter Stoupas
- **Oyster River:** Julia Belshaw, Tim Butler, Rita Freuder, Brian Gallagher, Ben Getchell, Julia Gittes, Filson Glanz, Harold Hocker, Jim Hornbeck, Deb Johnson, Tom Lee, Barbara Maurer and Gloria Quigley
- **Pemigewasset River:** Tom Anderson, Fred Gunter, Dennis O'Neil, Dan Perades, Max Stamp and Melissa Greenawalt-Yelle
- **Pennichuck Brook:** Kerrie Diers, Allen Fuller, Jon Heiss, Paul Johnson, Anne Krantz, Jim Mulvey, Kathryn Nelson and Brenden O'Shaughnessy.
- **Piscataquog River:** Sue Bonitatibus, Amy Doherty, Tim Doherty, Brian. Dresser, Jerry King, Addie Ann Lambarth, John Magee, Tom Noel, Karen Roy, Gordon Russell and Agnes Shellmer
- **Powwow River:** Cornelia Courtney, Adele Fiorillo, Chris Fisher, Bob Johnson and Larry Smith
- **Saco River:** Diane Giroux, Arthur Heigl, Melissa Hovey and Nancy Oleson
- **Wildcat River:** Joan Davies, Phil Davies, Bob Derrah, Betsey Harding, Dexter Harding, Sam Harding, Joan Kelley, Dave Matesky and Helene Matesky
- **Lake Winnipesaukee Tributaries:** Kurt Dietzer, Paul DelFrari, Rick Demark, Rick Friend, Gary Newfield, Ralph Pisapia, Justin Preisendorfer, Dave Sias, Pat Tarpey, Paula Wanzer, Winnie Ward, Headley (Lee) White and Irwin (Win) Wood