

**Progress Report on  
River Basin Water Quality Management Planning  
During 2007**

**A Report for:  
House and Senate Committees on Agriculture and Natural  
Resources and Energy**

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## Introduction

In 2007, the Vermont Agency of Natural Resources, Department of Environmental Conservation (DEC) and its municipal, regional and local watershed partners were fully engaged in the basin planning process in thirteen of Vermont's seventeen river drainage basins, an increase over the eleven river basins reported in last year's report.

The overall goal of each plan is to establish strategies that will:

- maintain, improve, or restore the surface waters of the basin,
- ensure full support of uses of the waters, and
- engage the many diverse parties in a watershed that are needed to reduce or eliminate pollution and protect high quality waters.

During the 2007 reporting period, the eight Vermont DEC Watershed Coordinators (sometimes also known as Basin Planners) engaged members of the public, non-profit organizations, landowners, farmers, foresters, loggers, local officials, government agencies and others in the basin planning/watershed initiative process. The eight DEC Watershed Coordinators are physically located in: Barre, Bennington, Essex Junction, St. Albans, St. Johnsbury, Springfield, Rutland and Waterbury<sup>1</sup>.

Basin plans and the basin planning process are required by the Vermont Statute 10 V.S.A. Section 1253(d), Section 1-02D of the Vermont Water Quality Standards, and the U.S. EPA 40 Code of Federal Regulations Part 130, Section 130.6 – Water Quality Management Plans.

## The Challenge

DEC Watershed Coordinators lead the development of individual river basin water quality management plans based on a visible and inclusive public involvement process. They serve as a vital communication link between the various state and federal agencies and local organizations that are directly or indirectly contributing to water quality improvement efforts. The Watershed Coordinators help educate and persuade individual landowners and business owners to prevent or abate what is essentially considered to be nonpoint source pollution from their property. The Coordinators facilitate the completion of projects, large and small, that correct locally identified problems and restore water quality. Watershed Coordinators, situated in the areas they are, are needed as a long-term local presence to ensure successful follow-through and implementation of such measures as the Lake Champlain Phosphorus Total Maximum Daily Load (TMDL) and other water quality plans throughout the state.

The Lake Champlain Phosphorus TMDL, for example, established phosphorus load allocations for each major lake watershed and included an implementation plan describing the major, basin-wide program efforts that will be needed to achieve these allocations. Through the DEC watershed planning initiative, strategies are developed by a public process to achieve goals and objectives identified for each major river basin statewide.

Translating TMDL load allocations and river basin plans into real, “on-the-ground” actions requires a locally coordinated implementation process. DEC Watershed Coordinators play a critical role in turning these plans into reality. Their job in a watershed is not finished until the goals derived through the public consensus process are implemented and water quality is improved.

The planning process and associated watershed projects are in varying stages in the different basins. One completed and ANR-adopted basin plan (White River; ANR adopted in 2002) is in a restoration phase. Its typing and classification petition, submitted by DEC to the Water Resources Panel and based on recommendations in the Plan, was withdrawn. A second completed and ANR-adopted basin plan (Poultney-Mettowee; ANR adopted in 2005) is also in a restoration phase. During 2006 and early 2007, DEC applied instructions developed by the Water

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<sup>1</sup> In April 2007, the Watershed Coordinator located in Waterbury who was carrying out basin planning for the Winooski resigned. The position has been vacant since her departure. DEC intends to fill the position in January 2008 and resume water quality management planning for the Winooski River basin.

Resources Panel concerning the manner in which to propose typing and classification petitions. Those instructions, and the process which arose out of them, became untenable and unsustainable and were subsequently abandoned.

Two other river basin water quality management plans (basin #11 - West/Williams/Saxtons and basin #14 - Waits/Wells/Ompompanossuc/Stevens) will be finalized in the first quarter of 2008 as those documents were authorized by the 2007 General Assembly to proceed for ANR adoption without containing recommendations for classification and water management typing. A fifth and sixth river basin plan (basin #7 - Lamoille and basin #5 - Northern Lake Champlain direct watersheds), now in final draft form, will be released to the public for comment and then finalized as interim plans during 2008. Six other river basin plans are under development with the respective councils and Watershed Coordinators holding meetings and prioritizing issues (Batten Kill/Walloomsac/Hoosic, Otter Creek, Missisquoi, Winooski, Ottauquechee/Black, Barton/Black/Clyde). It is probable that interim plans will also be finalized for the Otter Creek and Missisquoi during 2008. Importantly, remedial projects are being planned and implemented in each of the above noted river basins.

DEC's Watershed Initiative involves two parallel tracks of work, based on the DEC document entitled *Guidelines for Watershed Planning*. The first is the planning process track. Watershed planning activities use the grass roots approach and include: holding public forums to identify issues and concerns; forming a Watershed Council and facilitating Council meetings; ranking issues in order of priority; holding panel discussions on watershed topics of interest; formulating strategies to address the issues with the public and the council; developing surface water management goals; and with the public, collaboratively writing the watershed plan. The process also lays the groundwork for implementing projects by: raising public awareness of issues and solutions so that people are engaged and willing to act; bringing potential project partners together; identifying projects; determining funding sources; and coordinating the implementation. Although time-consuming, the planning track is essential to effective project implementation in the second track.

The second track involves on-the-ground watershed assessment, protection, and restoration projects to improve water quality. In addition to traditional biological, chemical and physical water quality monitoring efforts, examples of other assessment-type projects include Phase I and II stream geomorphic assessments that identify physical conditions and health in rivers and streams; bridge and culvert inventories that review the adequacy of these structures for road and stream protection and fish passage; and dam inventories. Protection and restoration projects can include: riparian buffer re-establishment, stream channel restoration and habitat improvement; trash/debris removal; selective dam removal; stormwater and agricultural best management practice implementation; securing easements; educating landowners; and working with municipalities on local protection strategies.

#### Difficulties Encountered

The Watershed Initiative has made significant improvements to the water quality of rivers, their tributaries and lakes since the initial years when only three Watershed Coordinators served the people of Vermont. As of December 1, 2007, DEC has a total of 8 watershed coordinators who are able to accelerate the initiative and put more remedial and protective projects in place.<sup>2</sup> Many federal and state dollars have been directly leveraged by grant writing and by the rationale and momentum of the planning process.

In spite of these accomplishments and as reported in last year's progress report, two noteworthy problems continue to affect the river basin and watershed water quality management planning process.

#### Issue #1.

The biggest challenge encountered in the watershed planning process is that it takes more time than initially anticipated to carry out an inclusive, action-oriented process involving the many stakeholders in a watershed resulting in a watershed water quality management plan that the public will identify with and implement. This truly grassroots effort in some river basins has started from square one as no watershed organization existed. The DEC

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<sup>2</sup> There were only seven DEC Watershed Coordinators between 4/07 and 12/07.

Watershed Coordinators form a diverse and inclusive watershed council, holds many public forums and conducts numerous panel discussions to provide the watershed council with the technical information necessary to formulate water quality remediation strategies, the “typing and classification” process, and the information needed for drafting of the plan.

Although this takes a far greater amount of time than originally scheduled, it is absolutely essential, given the nature of the pollution sources, to have the participation of all stakeholders and landowners who are all responsible for reaching solutions that contribute to the larger goal to restore Vermont's waters. The January 2006 deadline originally required by statute to complete all 17 river basin plans for the entire state has not been met. DEC's best estimate for completing all 17 river plans at current staffing levels remains as the year 2011.

#### Issue #2.

Typing and classification involves multiple meetings with towns, preparation of draft proposals and mediation where the typing or classification between towns may be inconsistent. As reported in last year's report, the White River Plan was completed in November 2002 and included recommendations for classification and water management typing. DEC prepared the petition for typing and classification and forwarded that to the Water Resources Board (now Water Resources Panel) on June 6, 2003. It was not until two years later (June 30, 2005) that the Board forwarded its approved final rules to the Legislative Committee on Administrative Rules (LCAR). LCAR remanded the approved final rules concerning waters in the White River basin back to the Water Resources Board. Now, some 2.5 years later, the rule for the typing and classification of the waters of the White River basin remains unsettled and has not been finalized.

Using a portion of the Poultney-Mettowee drainage area to apply guidance issued by the Water Resources Panel, DEC spent a considerable portion of 2006 developing recommendations for water management typing. The Panel's guidance was shown to be overly laborious and not practicable. For 2007, and with the interest to move completed basin plans along for adoption, DEC considered ways to modify the approach applied towards water management typing. In addition to being science-based and sustainable, typing must be "transparent" so that interested and affected persons can see its benefits and understand its implications.

In spite of being the single most time consuming element in completing basin plans, the can potentially bring the DEC Watershed Coordinators into a close contact with each municipality (e.g. select boards and planning commissions) and interested townspeople and foster numerous discussions that range from how municipal ordinances can be enhanced to improve local water quality to problems experienced on local tributaries and public treatment works. In some cases, discussions have linked back to situations which involving local revisions to municipal plans. DEC anticipates continued discussions during 2008 regarding possible alternatives to water management typing that achieve the same goals but in a far less complicated and acceptable manner.

#### Details of each Planning Process

The table appearing on the following page shows the major components of the basin planning process and their current status by basin as of the end of November 2007. Following this summary table is a map showing the approximate locations of the river basins and then thirteen progress reports, one for each basin. Each basin report concludes with a summary of planned actions for 2008.

## **Watershed Initiative Status (as of December 2007)**

### **Current Status by Basin**

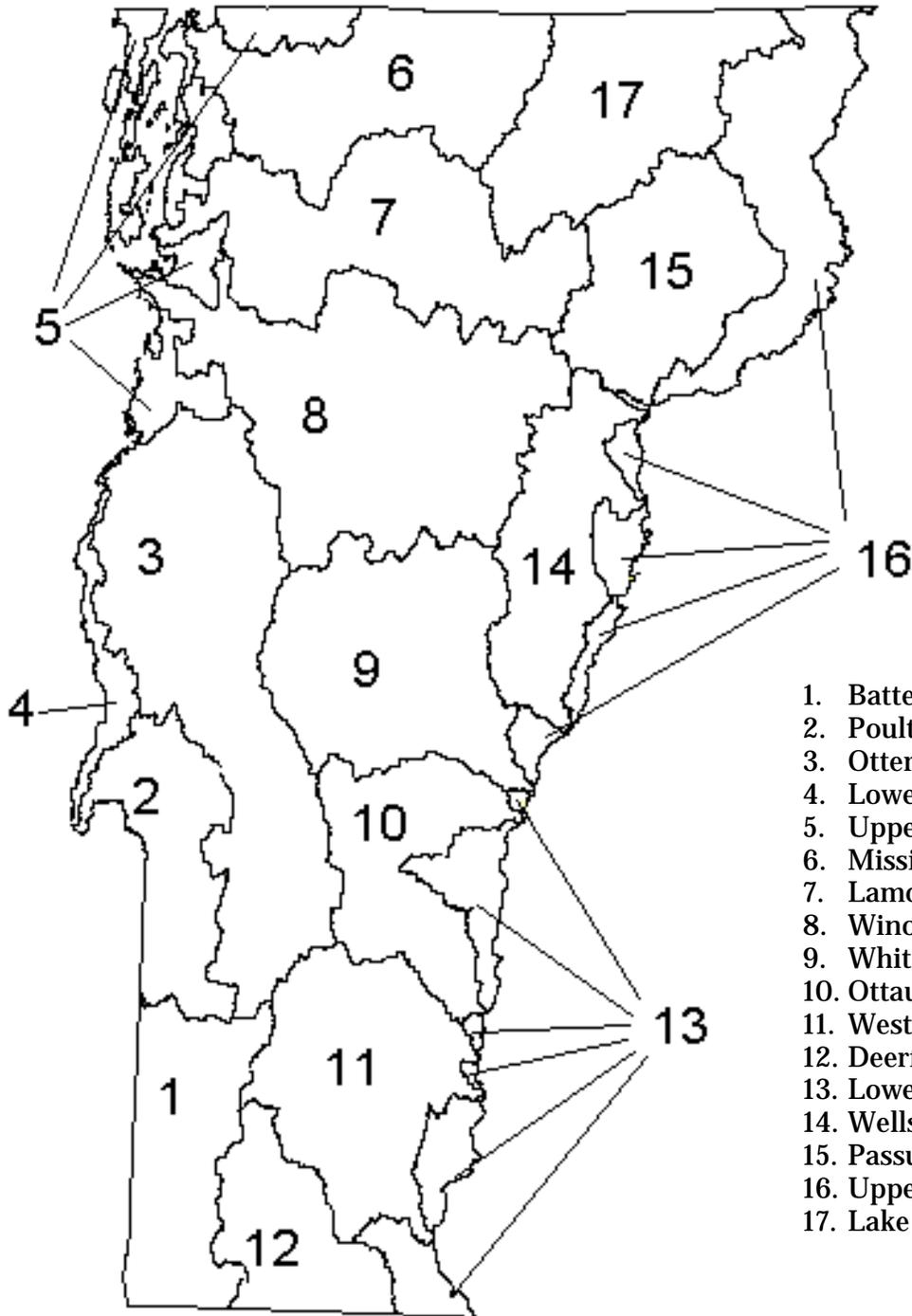
| <b>Components of the basin planning process</b>              | <b>Basin 1</b> | <b>Basin 2</b> | <b>Basin 3&amp;4</b> | <b>Basin 5</b> | <b>Basin 6</b> | <b>Basin 7</b> | <b>Basin 8</b> | <b>Basin 9</b> | <b>Basin 11</b> | <b>Basin 14</b> |
|--|----------------|----------------|----------------------|----------------|----------------|----------------|----------------|----------------|-----------------|-----------------|
| <b>Public forums held</b>                                    |                | C              | C                    | O              | I              | C              |                | C              | C               | C               |
| <b>Watershed Council formed</b>                              |                | C              | C                    | C              |                | C              |                | C              | C               | C               |
| <b>Local WQ* concerns identified</b>                         |                | C              | C                    | C              | O              | C              |                | C              | C               | C               |
| <b>Panel discussions on WQ issues held</b>                   |                | C              | O                    | O              | O              | C              |                | N/A            | C               | C               |
| <b>Strategies for WQ issues formulated</b>                   |                | C              | O                    | O              | O              | C              |                | C              | C               | O               |
| <b>Review of town plans &amp; zoning regulations</b>         |                | C              | I/O                  | O              | I              | C              |                | C              | O               | O               |
| <b>Develop water management type classification proposal</b> |                | C              | I/O                  | I              |                | C              |                | C              | O               | O               |
| <b>Meetings with towns on classification proposal</b>        |                | C              | I/O                  |                |                | C              |                | C              | I               |                 |
| <b>Watershed plan draft</b>                                  |                | C              | I                    | I              |                | C              |                | C              | I,C             | I               |
| <b>Public hearings on draft plan</b>                         |                | C              |                      |                |                |                |                | C              |                 |                 |
| <b>Final basin plan</b>                                      |                | C              |                      |                |                |                |                | C              |                 |                 |
| <b>Outreach to schools &amp; local groups</b>                |                | O              | O                    | O              | O              | O              |                | C              | O               | O               |
| <b>Basin Assessment Report</b>                               |                | C              | C                    | C              | C              | C              |                | C              | C               | C               |
| <b>Phase I Stream Geomorphic Assessments</b>                 |                | O/C            | O/C                  | O              | O              | O              | O              | O              | C,O             | O/C             |
| <b>Phase II Stream Geomorphic Assessments</b>                |                | O/C            | I/O/C                | O              | O              | O              | O              | O              | C,O             | O/C             |
| <b>Bridge and Culvert Inventory</b>                          |                | O/C            | I/O                  |                | O              | O              | O              |                | O               | O/C             |
| <b>Dam Inventory</b>   |                | I              |                      |                |                | C              |                | C              | See below       |                 |
| <b>Biological Monitoring</b>                                 |                | O              | O                    | I              | C              | O              | O              | C              | O               | O               |
| <b>Restoration Projects</b>                                  |                | C&O            | O                    | O              | O              | C&O            | C&O            | O              | C,O             | C&O             |

Table Key:

I = initiated, O = ongoing, C= completed, WQ = water quality

Basin 1 = BattenKill/Walloomsac/Hoosic; Basin 2 = Poultney-Mettowee Rivers;  
 Basin 3&4 = Otter Creek & lower Champlain direct; Basin 5 = Northern Lake Champlain;  
 Basin 6 = Missisquoi River; Basin 7 = Lamoille River; Basin 8 = Winooski River;  
 Basin 9 = White River; Basin 10 = Ottauquechee/Black; Basin 11 = West/Williams/Saxtons;  
 Basin 14 = Waits/Wells/Ompompanoosuc/Stevens; Basin 17 = Lake Memphremagog

# Vermont's Watersheds



1. Battenkill
2. Poultney-Mettowee
3. Otter Creek
4. Lower Lake Champlain
5. Upper Lake Champlain
6. Missisquoi
7. Lamoille
8. Winooski
9. White
10. Ottauquechee, Black
11. West, Williams, Saxtons
12. Deerfield
13. Lower Connecticut
14. Wells, Waits, Ompompanoosuc
15. Passumpsic
16. Upper Connecticut
17. Lake Memphremagog

## **Batten Kill, Walloomsac & Hoosic Rivers – Basin 1**

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### **Introduction**

The DEC Watershed Coordinator for the Batten Kill, Walloomsac and Hoosic rivers was hired in November 2006. The basin planning process for the area started shortly thereafter. In an effort to solicit community participation, the Coordinator organized and facilitated 14 initial informal public forums over several months. These public forums provided a platform for identifying local water quality concerns and interests in the waters throughout the basin. More importantly these forums gave community members an introduction to the basin planning program and information on ways for them to actively engage in the basin planning process. Local watershed organizations, community groups and town official were provided the opportunity to participate in the planning process and individual meeting were scheduled with groups interested in learning more.

At the completion on the public forums, two watershed councils were formed to help guide the basin planning process. These councils will act as the lead groups representing the two distinct watersheds present in basin 1; the Batten Kill and Hoosic River. Over the next year the councils will meet to prioritize the list of concerns addressed at the community forum, develop recommendations for addressing these concerns and create a vision for the management of local waters.

Projects completed throughout the basin include: Bennington County Conservation District (BCCD) Earth Day Event and Walloomsac River Cleanup; the Southwestern Chapter of Trout Unlimited (SWVTU) working with the Watershed Coordinator and DEC River Management Program to identify riparian landowners along the Batten Kill and Green River interested in participating in buffer planting projects for the spring 2008; the identification of the invasive algae *Didymosphenia geminata*, an invasive freshwater diatom species (microscopic algae), prompted immediate response from ANR. Signs were posted at all the access points throughout the Batten Kill and information for disinfection was provided to local outfitters. Over the coming year, local interest groups will work with the ANR Didymo Task Forces to provide the appropriate disinfection and educational to the local community.

### **Watershed Initiatives**

| Activity  | Status | Comments/Information  |
|---|--------|---|
| Public forums held  | C      | 14 public forums were held in 2007.   |
| Watershed Council formed                                    | I/O    | Watershed Councils were formed in 2007.   |
| Local water quality (WQ) issues identified                  | I/O    | Local water quality issues started to be identified throughout the basin.               |
| Panel discussions on WQ issues held                         |        |   |
| Strategies for WQ issues formulated                         | I/O    | Strategies for major water quality issues will be formulated by the watershed councils. |
| Review of town plans and zoning                             | I/O    | Town plan and zoning regulations will continue to be reviewed.                          |
| Develop water management type (WMT) classification proposal |        | .   |

|   |       |  |
|---|-------|--|
| Meetings with individual towns on the WMT classification proposal |       |  |
| Draft basin plan  |       |  |
| Public hearings on draft plan                                     |       |  |
| Final basin plan  |       |  |
| Outreach to area schools and local groups                         | I     | Working with local High School Teachers on a water quality monitoring program and service learning project                     |
| Basin Assessment Report   | C     | The basin assessment report was completed in August of 2002  |
| Phase I Stream Geomorphic Assessments                             | O/C/I | Completed in the Batten Kill in 2004. Walloomsac River completed in 2006. Phase I in the Hoosic will be completed this winter. |
| Phase II Stream Geomorphic Assessments                            | O/C   | .Completed for the Batten Kill in 2005. Completed in the Walloomsac River in 2007.   |
| Bridge and Culvert Inventory                                      | O/C   |  |
| Dam Inventory   |       |  |
| Biological Monitoring   |       | Scheduled with the BASS Lab for 2008.  |
| Restoration/Protection Projects Underway                          | O     | See below  |

Key: I = initiated, O = ongoing, C = completed

## River and Stream Restoration Projects

| Waterway   | Water Quality Concern  | Current Actions   |
|--|--|---|
| Walloomsac River<br>"Earth Day Clean-up"             | The Walloomsac accumulates a lot of trash associated with the stormwater runoff from the Town of Bennington, | The Bennington County Conservation District worked with the Community College of Vermont and the Bennington Trail Commission to hold an Earth Day event and two cleanups. These were both very successful events. |
| Batten Kill<br>"Buffers on the Batten Kill Campaign" | Buffers are one of the key components to maintaining and preserving water quality.                           | The Southwestern Chapter of Trout Unlimited and Batten Kill Watershed Alliance partnered to develop a list of willing landowner and hold sever buffer planting days.  |
| Didymo Task Force                                    | Invasive freshwater diatom species (microscopic algae) identified in the Batten Kill.                        | The Watershed Coordinator worked with the ANR Didymo Task Force to provide education materials and identify areas of concern throughout the Batten Kill.  |

## Conclusion & Plans for 2008

The basin planning process is underway and will continue for the Basin 1 area. Over the coming year, the two watershed councils will develop a prioritized list of concerns and develop action oriented recommendations for the waters contained in the watershed. The two councils will also work to identify water quality concerns and develop strategies for addressing these concerns, all of which will be included in the draft basin plan. These strategic recommendations, along with a goal for the management of the waters, will be included in the water quality management plan for the basin.

The Watershed Coordinator will take the lead in organizing the council meetings, providing council members the appropriate information for addressing water quality concerns and facilitate the development of the basin 1 planning process. In addition the coordinator will organize a local watershed panel discussion about water quality and contact the appropriate technical advisor to help provide the council the information necessary to identify the strategic recommendation for addressing local water quality concerns. The Watershed Coordinator will continue to identify watershed restoration projects, grant funding sources and partners for the continuing the action orientated watershed restoration projects. These projects will be implemented throughout the basin in conjunction with the planning process.

## ***Poultney & Mettowee Rivers – Basin 2***

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### **Introduction**

The Poultney-Mettowee Basin Plan was completed with ANR adoption in February 2005 in accordance with 10 V.S.A. Section 1253(d), the Vermont Water Quality Standards, the Federal Clean Water Act and 40 CFR 130.6. Final printing of the adopted plan in 2007 has allowed for distribution of the document to partners and residents throughout the Poultney Mettowee Basin. The plan will serve as a roadmap to guide projects within the watershed, and it will help to leverage funds to accomplish the goals it sets forth.

### **Watershed Initiatives**

| Activity  | Status  | Comments/Information   |
|---|---------|--|
| Public forums held  | C       | Public forums were held in 2001 & 2002 to identify water quality issues and concerns and also actions in which the participants were most interested.  |
| Watershed Council formed  | C       | The Poultney Mettowee Watershed Partnership was expanded to serve the role of watershed council.   |
| Local water quality (WQ) issues identified                        | C       | Through public forums, focus group discussions, public attitudes surveys, and other media outreach.  |
| Panel discussions on WQ issues held                               | C       | Many formats were used to explore water quality issues, including focus groups, public forums, surveys, and panel discussions.   |
| Strategies for WQ issues formulated                               | C       | Strategies were formulated with extensive public input and are in the Poultney Mettowee Basin Plan.  |
| Draft white papers for WQ issues                                  | C       | White papers on specific water quality issues were reviewed during the basin planning process.   |
| Review of town plans and zoning                                   | C       | The Rutland Regional Planning Commission reviewed town plans and zoning regulations in the Poultney Mettowee Basin as part of an EPA 604(b) pass-through grant. VLCT did an additional assessment of town plans and zoning regulations in the Fall of 2006 to update municipal information as part of the 10 VSA 1253 review for water management typing.              |
| Develop water management type (WMT) classification proposal       | On-hold | A water management typing and classification proposal for the basin is included in the final plan. A subsequent analysis of potential water management types was conducted as per guidance issued by the Water Resources Panel to ensure a transparent and defensible protocol is used for future typing efforts. However, this has proven ineffective and inadequate. |
| Meetings with individual towns on the WMT classification proposal | C       | The watershed coordinator, with assistance from the Poultney Mettowee NRC and the Watershed Partnership met with representatives from each town in the basin (planning commissions, conservation commissions, and select boards). A  |

|   |     |  |
|---|-----|--|
|   |     | subsequent effort to revisit the proposed water management types may need to be undertaken as per additional WMT B1 designations as per WRP guidance.  |
| Draft basin plan                            | C   | Draft released in July 2004 for 80-day comment period.   |
| Public hearings on draft plan               | C   | 3 public hearings were held on the draft plan – Aug. 5, Aug. 10, and Sept. 13, 2004  |
| Final basin plan                            | C   | Adopted February 2005 by Secretary of ANR.   |
| Outreach to area schools and local groups   | O   | Partners engage in continued outreach and involvement with schools and colleges in the basin (Fair Haven Elementary, Poultney Elementary, Mettowee Community School, Castleton State College, and Green Mountain College – Watershed Planning and Bioregionalism classes). |
| Basin Assessment Report                     | C   | Assessment report completed in 1999.   |
| Phase I Stream Geomorphic Assessments done  | C   | ANR Phase 1 geomorphic assessments completed for Poultney, Mettowee, Hubbardton, and Castleton Rivers. Additional Phase 1 SGA is underway for select tributaries to these larger rivers.   |
| Phase II Stream Geomorphic Assessments done | C   | Mettowee River phase 2 assessment completed 2007. Phase 2 now completed for Poultney (and select tributaries), Mettowee, and Hubbardton Rivers.  |
| Bridge and Culvert Inventory                | O/C | Culvert assessment in-progress or completed for each town in the Poultney Mettowee basin. Castleton assessment completed via ANR protocols 2005.   |
| Dam Inventory and Assessment                | O   | Associated with Phase 2 and 3 stream geomorphic assessments in progress to complete dam assessment where appropriate.  |
| Biological Monitoring                       | O   | There are approximately 60 biomonitoring sites that are sampled on a rotational basis throughout the basin.  |
| Restoration/Protection Projects Underway    | O/C | Most are agriculturally related streambank restoration sites on farms in the Mettowee and Poultney River basins. Rain gardens were installed in Poultney in 2006.  |

Key: I = initiated, O = ongoing, C= completed

## River and Stream Restoration Projects

| Waterway                    | Water Quality Concern   | Current Actions  |
|-----------------------------|---|--|
| Mettowee River              | Thermal modification, sedimentation, nutrient enrichment, geomorphic instability, elevated levels of pathogenic bacteria (Flower Brook) | River corridor planning and assessment, riparian outreach and planting project, lake resident outreach and riparian planting project (LEAP), thermal monitoring program, water quality monitoring program. |
| Poultney River              | Sedimentation, nutrient enrichment, geomorphic instability, elevated levels of pathogenic bacteria                                      | River corridor planning and assessment, riparian buffer planting and livestock exclusion, ongoing water quality monitoring. Municipal stormwater mitigation (2007).  |
| Hubbardton River            | Sedimentation, nutrient enrichment, geomorphic instability  | Riparian corridor restoration through buffer planting, livestock exclusion, conservation easements, and bio-engineered streambank restoration project.   |
| Castleton River             | Ongoing concerns over flooding, stormwater runoff, nutrient enrichment, and sedimentation.  | River corridor planning and assessment, draft FEH overlay under consideration for Castleton.   |
| Castleton River Gully Brook | Geomorphic instability causing flooding, sedimentation, nutrient  | Passive geomorphic restoration project completed summer 2004. Riparian corridor  |

|             |            |   |
|-------------|------------|---|
| (Castleton) | enrichment | restoration completed 2005. Confluence maintenance project in 2006. Phase 3 geomorphic assessment and conservation planning 2007. |
|-------------|------------|---|

## Conclusion & Plans for 2008

Overall, partners in the basin planning process have indicated that collective efforts have been quite successful in implementing high priority projects that have leveraged technical and financial resources from various partners. Many of the goals and corresponding strategies identified in the plan have been, or currently are being implemented in the areas of nutrient management, water quality monitoring and education, and streambank assessment and restoration. Resources have been allocated to provide additional nutrient management education and outreach services to farmers including education about new technologies and practices, and individual assistance for record keeping and nutrient management plan implementation.

This is the fifth year of a project to monitor and evaluate the water quality in the Poultney River, which now includes two years of sampling on the Mettowee River. The primary interest for expanding this project to the Mettowee River Basin specifically relates to phosphorus loading contributions to the southern segment of Lake Champlain (South Lake “B”). Several resident volunteers helped with water quality sampling and geomorphic assessment of nearby streambank conditions. This information is publicized on the Poultney Mettowee Watershed Partnership website and in the ongoing summer series of articles that appear in the *Lakes Region Free Press*.

For 2008, the partners involved in the basin planning process are committed to the ongoing implementation of strategies identified in the basin plan. There will be expanded river corridor planning and associated project activities, including additional geomorphic assessment of the tributaries throughout the watershed. Agricultural cooperators will see an increase of nutrient management technical assistance, resources, and funding through the Southern Vermont Nutrient Management Program. Coupled with this will be the development of a pilot program to look at performance based measures and incentives for nutrient management. A high priority will be ongoing restoration projects and public education activities. Also, high priority will continue to focus on outreach and education of water quality issues.

One significant outreach program was expanded this past summer on Lake St. Catherine - the Lake Education and Action Program (LEAP). Funded through the University of Vermont’s Sea Grant Program, the primary goal of the LEAP program is to protect lake watersheds from nonpoint source pollution by giving stakeholders the knowledge and skills they need to maintain their property in a non-polluting manner. While the eventual goal of this program is to reach several watersheds, it was decided that the second year should focus on one lake watershed area to modify the program and delivery mechanisms. The following years of the program will expand to other lake watersheds in the basin including Lake Bomoseen and Lake George (in the New York portion of the Poultney Mettowee Basin).

Finally, the basin planning process allowed partners to prioritize and implement several restoration projects throughout the basin this year. We have many other potential projects in the works for future restoration efforts. All of these will improve the water quality locally and reduce the phosphorus that reaches Lake Champlain.

### The South Lake Group

Partners in the Poultney Mettowee watershed have been meeting regularly as the “South Lake Group”, a subset of the Lake Champlain Citizens Advisory Committee to discuss issues and develop strategies for issues ranging from aquatic invasive species to phosphorus load reductions. Several resolutions regarding the South Lake initiative have been submitted to the Lake Champlain Citizens Advisory Committee for consideration. The group has expanded to include the entire South Lake (South Lake “A” and “B”) and has included partners on the New York side of the Lake as well. Other participants in this group include representatives from the Nature Conservancy (Southern Lake Champlain Valley Chapter), Lake Champlain Committee, Lake Champlain Restoration Association, Poultney-Mettowee NRC and the Vermont Water Quality Division.

## ***Otter Creek, Lewis Creek, Little Otter Creek – Basin 3***

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### **Introduction**

During 2007, the Rutland Natural Resources Conservation District (RNRCD) and the Vermont ANR continued to sponsor the meetings and activities of the Upper Otter Creek Watershed Council (UOCWC) from the headwaters downstream to the vicinity of the Neshobe River in Brandon. The Council continues to identify the existing and potential causes and sources of pollution that can influence surface waters of the Otter Creek basin. The UOCWC organized meetings and site visits, and facilitated discussion on basin issues such as the Better Backroads Program, DEC Wetlands Program, USDA-NRCS Wetlands Reserve Program, DEC Stormwater Management Program, the Rutland County Portable Skidder Bridge Program, stream geomorphic assessment reports, agricultural water quality issues, water quality monitoring, and municipal actions to improve water quality (a joint meeting with the Rutland Regional Planning Commission's "Zoning Administrators Roundtable" series).

Several highlights for 2007 include the following on-going projects throughout the basin:

The Moon Brook River Corridor Planning and Restoration Project (stormwater impaired)

The RNRCD in partnership with Vermont DEC and the Town and City of Rutland will develop a River Corridor Management Plan for Moon and Mussey Brooks. The Plan will build upon the Phase I and II Stream Geomorphic Assessment completed by Bear Creek Environmental in 2005. The Phase I and II results provide the basis for determining management strategies that will help people make good decisions about land use within the river corridor.

The plan will catalogue and prioritize protection and restoration needs, identify appropriate restoration and/or protection strategies and list opportunities and barriers to immediate restoration/protection efforts. The recommendations will focus management efforts on long term stability as opposed to short term mitigation. The corridor management plan will serve as continued guidance for efforts to protect the water quality of the Moon and Mussey Brook.

Another component of the project will be the analysis of the implications of Fluvial Erosion Hazard (FEH) Zoning in Rutland. This analysis will be used in future exploration of the potential for Fluvial Erosion Hazard Zoning and will consider the FEH corridor, parcel configuration and existing limitations to development such as local zoning or the presence of protected resources such as wetlands. The analysis will be used to help the town understand how FEH zoning would compare to alternative river protection strategies and how it would impact land use potential along the river.

Otter Creek Agricultural Work Group

This work group, which continues to review and inform the agricultural section of the basin plan throughout the watershed, has been meeting on a quarterly basis. The agricultural work group meets periodically to discuss water quality issues as they pertain to agricultural land use within the basin. Recently, the Work Group met to review and discuss the content and format of the agricultural section of the Upper Otter Creek section of the basin plan, as well as to review progress made in addressing impaired surface waters where the problem has been attributed to runoff from the working landscape.

In addition, the DEC Watershed Coordinator and the Agricultural Basin Planner/Resource Specialist held several farmer discussion groups regarding basin planning and water quality protection in the Otter Creek Watershed.

These workshops included a nuts and bolts overview of basin planning and current conditions in the Otter Creek. In addition, agricultural resource and nutrient management program information was provided. Several dairy and horse farmers who attended were solicited for input regarding agricultural strategies and invited to participate in future Otter Creek Agricultural Work Group meetings.

**Otter Creek Revitalization Team**

The Vermont Council on Rural Development (VCRD) and the Town of Middlebury have embarked on several public forums to develop a comprehensive approach to promote creative economic opportunities. Middlebury area residents are working with a statewide resource team to develop basic action plans for: 1) improving use of the Otter Creek, 2) forming a creative economy umbrella association, and 3) becoming a pioneer in alternative energy production and reduction of local energy demand. The Watershed Coordinator is participating on the resource team to brainstorm ideas and develop goals and strategies to “Make Better Use of the River.” The premise behind the action plan to address Otter Creek issues revolves around the Creek, which bisects downtown Middlebury and provides one of its most scenic assets, yet it remains a largely untapped resource to promote recreation and tourism.

**Addison County River Watch Collaborative Outreach and Education Project**

The ACRWC Education and Outreach Project will include a comprehensive assessment of Otter Creek, Little Otter Creek and Lewis Creek water quality conditions, greater citizen and community understanding of water quality conditions, watershed specific educational materials to inform protection and improvement activities, and a model for other watershed stewardship groups to follow. An education and outreach component of this project is underway. The Otter Creek ANR Watershed Coordinator has been assisting the ACRWC with project development, funding, and implementation. A waterbody status table was created by the Watershed Coordinator as a basis for discussion regarding attainment of Vermont Water Quality Standards for waterbodies monitored by ACRWC.

**Otter Creek Hydroelectric Project – Relicensing by the Federal Energy Regulatory Commission (FERC).**

FERC is conducting National Environmental Policy Act (NEPA) scoping on the anticipated license application for the Otter Creek Hydroelectric Project located on the Otter Creek mainstem in Addison and Rutland Counties. The Watershed Coordinator reviewed the Otter Creek Wasteload Allocation Study (1979) and most recent 401 certifications for the Otter Creek Hydroelectric Project to help assist FED-Dams Safety and Hydrology Section and inform preliminary water quality monitoring plans for initiating sampling this summer in advance of other study efforts that will be conducted in 2008. The Watershed Coordinator also assisted DEC's Facilities Engineering Division and the Department of Fish and Wildlife with site visits of the proposed projects that are anticipated to undergo NEPA scoping on the anticipated FERC license application for the Otter Creek Hydroelectric Project located on the Otter Creek in Addison and Rutland Counties. The Watershed Coordinator represented ANR during the evening scoping meeting in Proctor to listen to the issues and concerns of meeting participants as they pertain to the re-licensing of the Otter Creek Project (Vermont Marble Power Company – Omya, Inc.).

**Rutland County Portable Skidder Bridge Project**

The DEC Watershed Coordinator partnered with the ANR Watershed Forester to develop the Rutland County Skidder Bridge Project which involved the construction of two portable skidder bridges for rental use by Rutland County loggers on logging jobs to minimize impacts on water quality at stream crossings. These bridges are leased to area loggers for placement over streams which will help reduce sedimentation and erosion due to silvicultural practices. Both of the bridges constructed for this project are now in use in Southern Rutland County.

**Watershed Initiatives**

| Activity                 | Status | Comments/Information   |
|--------------------------|--------|--|
| Public forums held       | C      | A series of public forums were held in Rutland County in the winter of 2003 and in Addison County during the spring 2004.  |
| Watershed Council formed | C      | The Upper Otter Creek Watershed Council was formed in the spring of 2003. Existing watershed groups are established in the Addison County portion of the basin. A basin wide agricultural work group has |

|   |         |   |
|---|---------|---|
|   |         | been meeting quarterly.   |
| Local water quality issues identified                       | C       | Major WQ issues have been identified through public forums. Recently, a public attitudes survey was developed and will be implemented in Addison County.  |
| Panel discussions on water quality issues held              | C       | Several panel discussions were held throughout the basin in 2004, 2005, and 2006.   |
| Strategies for water quality issues formulated              | O       | The UOCWC, basin-wide advisory committee, AG work group, and various stakeholders continue to develop and review draft strategies to address WQ issues.   |
| Draft white papers for water quality issues                 | O/C     | Issue papers for priority WQ concerns identified thus far are currently being drafted and reviewed.   |
| Review of town plans and zoning                             | C       | Completed for Rutland County. Completed as a 604b grant project for Addison County RPC for 2006.  |
| Develop water management type (WMT) classification proposal | On-Hold | To be determined.   |
| Meetings with towns on the WMT classification proposal      | O       | The Addison and Rutland RPC's had been assisting in this effort. However, the status of WMT is TBD.   |
| Draft basin plan  | O       | A rough draft plan has been developed in 2007 with anticipated review and revisions to occur in early 2008.   |
| Public hearings on draft plan                               |         | Anticipated in 2008.  |
| Final basin plan  |         |   |
| Outreach to area schools and local groups                   | O       | Partners engage in outreach and education with schools and colleges in the basin (Smokey House Center, Currier School, Success School, Rutland High School, Stafford Tech Center, North Branch School, Middlebury High School, Middlebury College, Mount Abraham Union HS, Champlain Valley Union HS, The Watershed Center, UVM, CCV, and Patricia A. Hannaford Career Center). |
| Basin Assessment Report                                     | C       | The last assessment report was completed in 1998. An updated assessment report is anticipated.  |
| Phase I and II Stream Geomorphic Assessments                | O/C     | Phase 2 underway or completed on the mainstem of the Otter Creek (select reaches), Cold River, East Creek, Leicester River, Lemon Fair River, Lewis Creek, Little Otter Creek, Mill River, Moon Brook, Neshobe River, New Haven River, and the Middlebury River.  |
| Bridge and Culvert Inventory                                | O/C     | AOT culvert assessments have been completed for most towns in the Rutland County portion of the Otter Creek basin and about half the towns in Addison County.   |
| Dam Inventory   | O       | Some dam assessment as part of Phase 2 SGA  |
| Biological Monitoring                                       | O       | There are approximately 100 bio-monitoring sites that are sampled on a rotational basis throughout the basin.   |
| Restoration/Protection Projects Underway                    | I/O/C   | See table below.  |

Key: I = initiated, O = ongoing, C = completed

## River and Stream Restoration Projects

The DEC Watershed Coordinator has collaborated on multiple projects and/or grants leading to projects, often for multiple years and funding cycles with partners in the basin since 2001. These grant types include EPA pass-through grants (319 and 604b), competitive watershed grants (Lake Champlain Basin Program, UVM-Sea Grant), foundations (Vermont Community Foundation, Musser, NFWF), and state grant programs (Watershed/

conservation license plate grant program, LaRosa Laboratory Grants for Analytical Services, and the River Management Program – River Corridor Grants through Clean and Clear). Examples include:

- Upper Otter Creek geomorphic assessment on Cold and Mill Rivers (underway)
- River Corridor Planning initiated for the Moon Brook watershed
- Assessment of biological, chemical, and physical condition of waters (ongoing)
- Mussey Brook Alternatives Analysis (completed)
- Outreach and enrollment of riparian landowners in USDA-NRCS cost share programs, especially where CREP can be combined with CRP (underway)
- WHIP projects – developed collaboratively with USDA-NRCS and RNRCD
- Lewis Creek Stark Valley Corridor Planning Project (underway)
- New Haven River Corridor Management Planning and FEH development (completed)
- Tenney Brook Restoration Project (initiated)
- Otter Creek Wetlands Restoration (Pittsford – completed)

Ongoing, long-term projects include:

| Waterway                                    | Water Quality Concern  | Current Actions  |
|---|--|--|
| Otter Creek main stem                       | Sedimentation, nutrient enrichment, high levels of pathogenic bacteria. Diminished flows through bypass reaches of hydro facilities.   | Numerous agriculturally-related streambank and buffer restoration projects on farms in the watershed. Stormwater runoff remediation projects implemented in Middlebury and Rutland.  |
| Moon and Mussey Brooks East Creek (Rutland) | High levels of pathogenic bacteria, sedimentation, nutrient enrichment, urban (stormwater) impairment due to runoff, thermal modification, and low dissolved oxygen levels resulting from impoundments and hydro operations (East Creek) | Watershed improvement projects underway with Rutland City – 2007 Phase 2 geomorphic assessment completed. Public outreach and awareness underway for residents of the Moon/Mussey watershed. Stormwater runoff remediation project implemented in Rutland.                                     |
| Middlebury River                            | High levels of pathogenic bacteria, sedimentation, nutrient enrichment, impairment due to agricultural runoff  | Phase 2 geomorphic assessment has indicated areas of instability. Riparian corridor restoration through buffer planting, livestock exclusion, AG land taken out of production along riparian corridor. Passive river restoration (conservation) project planned in east Middlebury.            |
| New Haven River                             | Geomorphic instability, flooding, historic channel modification threatens transportation infrastructure  | Phase 2 geomorphic assessment completed, floodway determination, bridge and culvert assessment associated with transportation upgrades. FEH development completed for Lincoln town. Better Backroads project in Lincoln completed 2007. River corridor planning initiated for town of Bristol. |
| Lewis Creek                                 | Nutrient enrichment, sedimentation, geomorphic instability, historic channel modifications   | Phase 2 geomorphic assessment completed, water quality monitoring, riparian corridor planning/ protection project, outreach with towns in the watershed, CREP. River Corridor Plan completed for Stark Valley – associated projects in planning and implementation phase.                      |

|                    |  |  |
|--------------------|--|--|
| Little Otter Creek | High levels of pathogenic bacteria, nutrient enrichment, historic channel modification | Outreach to agricultural cooperators for buffer planting, livestock exclusion, NRCS cost-share programs, water quality monitoring ongoing. |
|--------------------|--|--|

## Conclusion & Plans for 2008

Overall, the planning process has provided many opportunities for collaborative problem solving among stakeholders that we anticipate for future, successful restoration efforts throughout the Otter Creek Basin.

For 2008, stakeholders and water quality issue groups will continue drafting sections of the Otter Creek Basin Plan to address major issues and develop corresponding strategies. Major topics that are being addressed by working groups will include agriculture, transportation infrastructure (bridge and culvert effects on streams and gravel road erosion), riparian corridor protection, and suburban and urban runoff (stormwater). The Upper Otter Creek Watershed Council as well as existing watershed groups in Addison County will pursue ongoing watershed improvement projects, water quality monitoring, geomorphic assessment, municipal planning opportunities, and public outreach, education, and awareness. Based on assessment, monitoring, and public participation, the highest-ranking projects and activities will be pursued for funding and implementation.

## ***Various drainages emptying to Lower Lake Champlain – Basin 4***

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### Southern Lake Champlain Basin Citizens Advisory Committee

The newly formed Southern Lake Champlain Advisory Committee organized by Vermont Citizens Advisory Committee member Sandy Kuehn, hosted a “South Lake” public meeting also sponsored by the VTCAC, Lake Champlain Basin Program, and the Agency of Natural Resources (VTANR) to discuss the progress of the ANR Reorganization, overview of the ANR Task Force Report on the Center for Clean and Clear, and challenges of the South Lake region of Lake Champlain.

Partners in this effort have been meeting regularly as the “South Lake Group”, a subset of the Lake Champlain Citizens Advisory Committee to discuss issues and develop strategies for issues ranging from aquatic invasive species to phosphorus load reductions. Several resolutions regarding the South Lake initiative have been submitted to the Lake Champlain Citizens Advisory Committee for consideration. The group has expanded to include the entire South Lake (South Lake “A” and “B”) and has included partners on the New York side of the Lake as well.

## **Various drainages emptying to Northern Lake Champlain - Basin 5**

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### **Introduction**

A watershed council for this drainage area met for the first time in April 2003. The DEC Watershed Coordinator and the watershed council committed themselves to developing the watershed plan and assisting in the implementation of watershed restoration projects. The council supported the Coordinator's proposal to hold three public meetings to identify the most prominent concerns of the affected communities. The council also agreed that local groups would develop the first draft of strategies for each of the community's concerns.

The watershed council agreed to the Agency's proposal that the watersheds of the Rock and Pike Rivers would be included in the Missisquoi River Basin planning process (refer to basin 6 report below). The Franklin County Natural Resource Conservation District also met with the Missisquoi River Basin Association to discuss this option and the group agreed with this approach. The Rock and Pike Rivers' communities are more closely tied with the communities of the Missisquoi River watershed and landscape than those along the Lake.

During 2004, the Watershed Coordinator began to work with local groups to develop strategies for restoring and protecting water quality along tributaries to Lake Champlain. Since 2005, the Coordinator has worked on various projects and has completed a draft of the basin water quality management plan and has begun internal review of the document. A draft plan will be released for public comment in 2008.

### **Watershed Initiatives**

| Activity  | Status | Comments/Information  |
|---|--------|---|
| Public forums held  | C      | Forums held in Shelburne, Colchester, North Hero, and St. Albans.   |
| Watershed Council formed  | C      | A diverse task force was formed and is assisting in the development of a draft watershed plan.  |
| Local water quality issues were identified                        | C      | Top issues in the basin include: nuisance aquatic species, urban/suburban runoff, drinking water supply quality, farming issues, streams, causeways.    |
| Panel discussions on water quality issues held                    | C      | Presentations and roundtable discussions were held in different parts of the basin in the spring and summer of 2003.                                    |
| Strategies for water quality issues were formulated               | C      | Strategies were developed with local groups and then reviewed and revised by the watershed council. Strategy development took place during 13 meetings. |
| Review of town plans and zoning                                   | O      | Town plans were completely reviewed for Chittenden and Franklin counties.   |
| Develop water management typing (WMT) and classification proposal | I      | A proposal will be developed over the next year based on existing, reasonably attainable, and desired water quality.                                    |
| Meetings with individual towns on the WMT classification proposal |        |   |

|   |     |   |
|---|-----|---|
| Draft basin plan                          | O   | The draft basin plan is nearing completion and a completed draft plan is expected to be available for public review in 2008.  |
| Public hearings on draft plan             |     |   |
| Final basin plan                          |     |   |
| Outreach to area schools and local groups | O   | Groups with which we are working include La Platte River Partnership and St. Albans Area Watershed Association. Letters have been sent to all town officials in the basin. Articles have appeared in local newspapers.      |
| Basin Assessment Report                   | C   | Completed in December 2003.   |
| Phase I Stream Geomorphic Assessments     | I/C | These assessments are completed for the LaPlatte River mainstem and major tributaries, and Jewett, Stevens and Rugg Brooks, parts of Mill Brook, Stonebridge Brook, and several small tributaries on the Georgia shoreline. |
| Phase II Stream Geomorphic Assessments    | I/C | These assessments are completed for segments of the LaPlatte River, Bartlett Brook, Englesby Brook, Indian Brook, Munroe Brook, Potash Brook, Stevens and Rugg Brooks.  |
| Bridge and Culvert Inventory              | O   | An inventory has begun for Georgia.   |
| Dam Inventory                             |     |   |
| Biological Monitoring                     | C   | Additional waters have been identified and macroinvertebrates sampled to determine long-term water quality trends of specific waters.   |
| Restoration/Protection Projects Underway  | I   | Numerous protection and restoration projects are underway throughout the watershed (see below).   |

Key: I = initiated, O = ongoing, C= completed

## River & Stream Restoration Projects

| Waterway                         | Water Quality Concern          | Current Actions  |
|----------------------------------|--------------------------------|--|
| Northern Lake Champlain Basin    | Nutrients, hydrology           | Rain garden education including presentation on benefits to reducing stormwater pollution and how to install on a residential property to Burlington Flower Show attendees.  |
| Northern Lake Champlain Basin    | Nutrients, sediment, hydrology | Education on lake-friendly lawn care including development of brochure "Don't P on your lawn and other lake-friendly lawn care practices." Over 4,000 brochures distributed and slogan used by AAF&M in TV ads worth \$25,000 to promote the use of phosphorus-free lawn fertilizer. Developed a display based on the brochure and used at Burlington Flower Show. |
| Shelburne Bay via LaPlatte River | Nutrients, sediment            | The use of bio-infiltration structure to reduce stormwater flows to an adjacent stream is in the planning stages.  |
| St. Albans Bay via Stevens Brook | Nutrients                      | A phosphorus-free fertilizer rebate program with watershed group.  |
| St. Albans Bay via Stevens       | Nutrients, sediment            | Engineered plans for the installation of permeable concrete side walks along the length of Taylor Park in St. Albans City to treat stormwater.   |

|                                  |                                |   |
|----------------------------------|--------------------------------|---|
| St. Albans Bay via Stevens Brook | Nutrients                      | Work with the St. Albans Area Watershed Association on campaign to reduce fertilizer use that included educating businesses, poster contest, radio PSAs, articles, TV interview.  |
| St. Albans Bay via Stevens Brook | Nutrients                      | Worked with UVM professor, NWRPC, to place experimental units at the end of stormwater pipes to remove phosphorus from urban stormwater. The units use iron slag, an end product from an electric arc furnace.  |
| St. Albans Bay via Stevens Brook |                                | Developed optical brightener survey as a way to detect illicit discharges to Stevens Brook. BFA science teacher received supplies and technical assistance to begin the project with students. City public works director will and has followed up on testing results including the use of dye testing. |
| St. Albans Bay                   | Nutrients, sediment, hydrology | Presentation on development related water quality problems in Franklin and Grand Isle Counties to 16 municipal officials in Swanton and to St. Albans planning commission.  |
| St. Albans Bay                   | Aquatic nuisance species       | Eurasian watermilfoil and nuisance native species were harvested.   |

## Conclusions & Plans for 2008

In 2007, the DEC Watershed Coordinator focused on developing projects with local groups and municipal, state, and federal staff, and preparing a draft of the basin water quality management plan.

In 2008, the focus will be on completing the basin plan for public review and continuing project implementation. The chapter on establishing water management goals, including the typing and classification proposal, will not be included in the 2008 draft. The Agency of Natural Resources is working with the Vermont Water Resources Panel to develop new guidelines for water management typing. In addition, the Watershed Coordinator will continue outreach with watershed groups, towns, regional planning commissions and other stakeholders in a basin planning process; continue to secure grants and move forward on projects in the basin; continue collaboration with all partners on priority issues; and conduct ongoing education and outreach with residents of the watershed.

## **Missisquoi Bay - Basin 6**

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Note: Although the Rock and Pike River watersheds are considered to be part of the Northern Lake Champlain Basin (basin 5) planning unit, these waters and their watershed areas have been included into the Missisquoi Bay basin planning process along with the Missisquoi River as all three flow to and affect Missisquoi Bay.

### **Introduction**

Despite favorable weather conditions in 2007 that reduced the number and frequency of algal blooms in Missisquoi Bay, public concern over water quality in the Bay remains high. The general public, as well as local, state, and federal agency representatives continue to actively participate in the basin planning process. The Missisquoi Bay Watershed Council worked to finalize a draft list of water quality strategies for inclusion in the watershed action plan. The offices of the Secretary of the Agency of Natural Resources and the Deputy Secretary of the Agency of Agriculture continued to actively participate in the Council's deliberations.

In addition to basin planning meetings and projects, the DEC Watershed Coordinator has been working to implement water quality improvement projects in the watershed, including a stream and wetland restoration project on the main tributary to Lake Carmi, which is being partially supported through Clean and Clear grant funds. The Watershed Coordinator has also continued to provide technical support for local watershed groups as they prepare priority action lists, conduct water quality monitoring, and implement various projects. In particular, the Coordinator assisted the Friends of Missisquoi Bay with establishing a volunteer water quality monitoring project in the Rock River watershed, including technical assistance with their applications for DEC Analytical Partnership Program and an EPA Monitoring Equipment Loan Program, both of which were successful. The Coordinator continued regular contact with local media regarding meeting schedules, implementation activities, and particular issues of interest. The Coordinator served on the ANR reorganization task force for the Center for Clean and Clear (CCC), supported visits by ANR Secretary and the CCC Director to Missisquoi Bay Watershed Council meetings and to sites in the watershed and also helped with revisions to the CCC workplan.

Lastly, the Coordinator supported the Missisquoi River Basin Association's work to designate parts of the Missisquoi River and some of its tributaries under the National Park Service's Wild and Scenic river system. The Vermont Congressional delegation has introduced legislation in both the US Senate and House to initiate an eligibility study, which is the next step in the process. Local representatives will participate in a steering committee overseeing the study. If the study supports designation of some or all proposed river reaches, the affected towns will have the opportunity to vote on any proposed designation before Congress completes the process.

### **Watershed Initiatives**

| Activity                        | Status | Comments/Information  |
|---------------------------------|--------|---|
| Public forums held              | C      | Six forums held in January and February 2005.                       |
| Watershed Council formed        | C      | First meeting in April 2005. Membership formalized in October 2006. |
| Local water quality (WQ) issues | C/O    | Identified at public forums, discussion ongoing.                    |

|   |     |   |
|---|-----|---|
| identified  |     |   |
| Panel discussions on WQ issues held                               | O   | Panel discussions held on phosphorus, septic systems, education, agricultural issues, fish and wildlife, and river corridor management. |
| Strategies for WQ issues formed                                   | O   | Draft strategies developed with Watershed Council.  |
| Review of town plans and zoning                                   | O   | With assistance from the Northwest Regional Planning Commission.  |
| Develop water management type (WMT) classification proposal       |     | On hold due to deliberations of the Water Resources Panel of the VT Natural Resources Board.  |
| Meetings with individual towns on the WMT classification proposal |     |   |
| Draft basin plan  | O   | Sections underdevelopment.  |
| Public hearings on draft plan                                     |     |   |
| Final basin plan  |     |   |
| Outreach to area schools and local groups                         | O   | Working closely with existing organizations.  |
| Basin Assessment Report   | C   | Basin assessment report completed November 2004.  |
| Phase I Stream Geomorphic Assessments                             | C/O | Completed in all of Franklin and Orleans Counties.  |
| Phase II Stream Geomorphic Assessments                            | O   | Underway in select rivers and streams, with guidance from Watershed Coordinator.  |
| Bridge and Culvert Inventory                                      | C/O | Completed on some reaches in Franklin and Orleans Counties.   |
| Dam Inventory   |     |   |
| Biological Monitoring   | O   | Included in 2004 rotational program.  |
| Restoration/Protection Projects Underway                          | C/O | Initiated one project and supported those of local groups, state and federal agencies.  |

Key: I = initiated, O = ongoing, C= completed

## River & Stream Restoration Projects

| Waterway                        | Water Quality Concern          | Current Actions   |
|---------------------------------|--------------------------------|---|
| Missisquoi River                | Excessive phosphorus & erosion | Technical support and laboratory analysis (DEC partnership) for year three of MRBA volunteer water quality monitoring.                      |
| Rock River                      | Excessive phosphorus & erosion | Technical support and laboratory analysis (DEC partnership) for first year of Friends of Missisquoi Bay volunteer water quality monitoring. |
| Pike River/Lake Carmi watershed | Excessive phosphorus & erosion | Funding for a stream and wetland restoration project on Marsh Brook.  |

## Conclusion & Plans for 2008

As the ANR reorganization is implemented, it is expected that the new CCC will become the lead state government unit on water quality issues in the Northern Lake Champlain watershed. The Watershed Coordinator's position is expected to transition to the CCC, with continuing responsibilities in community liaison and technical analysis work. The water quality management plan for the Missisquoi Bay basin is slated to be completed and finalized as an interim plan, dovetailing with the CCC workplan which will be the blueprint for implementation efforts in the entire Northern Lake Champlain watershed. The Coordinator will closely monitor progress concerning potential Wild and Scenic designation.

## **Lamoille River – Basin 7**

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### **Introduction**

The DEC Watershed Coordinator and watershed partners have developed a draft water quality improvement plan for the Lamoille River watershed drainage area. The draft plan outlines the top water quality priorities for the watershed, the sources of pollution, and the specific actions to address these issues including planning, monitoring and assessment, protection, and restoration strategies. Noteworthy activities by major category are introduced below:

#### **\*Assessment and Monitoring**

Additional physical, chemical, and biological monitoring and assessment activities directed at lakes, ponds, and streams within the drainage area occurred because of the watershed initiative. Nearly half of the Actions Items identified in the draft plan have been initiated or completed. Phase 1 and 2 geomorphic assessments were completed in the following sub-watersheds: the upper Lamoille, Lamoille River, Browns River, Gihon, Centerville Brook, North Branch, Elmore Branch, Wild Branch, and Lamoille main stem. Macroinvertebrate sampling has been completed for the Lamoille River, Gihon River, an unnamed tributary to the Brewster River, Rodman Brook, and the Wild Branch.

#### **\*Urban-related Runoff Restoration and Outreach**

Numerous watershed restoration projects were identified and implemented during the 2007 field season. The Watershed Coordinator assisted the Town of Walden in the design and fund raising to remediate 7 road-related erosion projects. The Coordinator also assisted the Town in the implementation of 3 Better Backroads projects. The Coordinator assisted Johnson State College in the implementation of a major gully erosion site on campus responsible for large sediment discharges to the Gihon River.

#### **\*Agriculture and Logging-related Restoration and Outreach**

The Coordinator assisted the Caledonia and Lamoille NRCs in the establishment of riparian buffers at seven sites along the Lamoille River along agricultural lands. The *Trees for Streams* riparian buffer initiative was successfully expanded to the Caledonia and Chittenden County portions of the watershed. The Coordinator, Lamoille NRC, and VT DFPR launched a new innovative initiative called the Portable Skidder Bridge Project that makes available 3 portable skidder bridges to watershed loggers and foresters, reducing erosion at logging stream crossing sites. The Coordinator led a Youth Conservation Corps crew in installing 3 stone lined waterways to address agricultural field erosion to the Lamoille River in Morrystown. The Lamoille Valley Farm and Forest Initiative was formally launched to include a full day conference and Farm and Forest Directory in an effort to preserve the Working Landscape. The lower Lamoille Wetland Restoration Project was initiated and inventoried high priority wetlands for restoration on agricultural lands.

#### **\*Impaired Waters Remediation**

The Coordinator and watershed partners have initiated watershed restoration and inventory activities in several impaired waters including Deer Brook, the Browns River, the unnamed tributary to the Brewster River, and Mill Brook. The Coordinator identified a new iron/metals seepage discharge to Rodman Brook and directed BASS Lab sampling there. The Coordinator is participating in the Vermont Asbestos Mine remediation group and recommending additional treatment options at the site in the Gihon watershed.

## Watershed Initiatives

| Activity  | Status | Comments/Information  |
|---|--------|---|
| Public forums held  | C      | Eight public forums were held at the onset of basin planning.   |
| Watershed Council formed  | C      | A diverse task force was formed and assisted DEC in the development of a draft watershed plan   |
| Local water quality (WQ) issues identified                        | C      | Top local water quality issues include stormwater, streambank erosion and flooding, agricultural runoff, loss of working farm and forestland, lake and pond issues, and dam-related issues  |
| Panel discussions on WQ issues held                               | C      | A series of panel discussions was held for each of the top water quality issues   |
| Strategies for WQ issues formed                                   | C      | The strategies are written.   |
| Review of town plans and zoning                                   | C      | Completed.  |
| Develop water management type (WMT) classification proposal       | C      | A WMT proposal was developed based on existing, reasonably attainable, and desired water quality.   |
| Meetings with individual towns on the WMT classification proposal | C      | The watershed coordinator has held over 40 meetings with select boards, planning commissions, and conservation commissions.   |
| Draft basin plan  | C      | A draft basin plan has been developed.  |
| Public hearings on draft plan                                     | I      | Planned for 2008.   |
| Final basin plan  | I      | Planned for 2008.   |
| Outreach to area schools and local groups                         | O      | Educational programs presented to loggers and foresters in the Portable Skidder Bridge project, Better Backroads Roads and Rivers Workshop, Laraway School students, Lamoille Valley Farm and Forest Initiative Workshop, YCC crew members, landowners, and municipalities.   |
| Basin Assessment Report   | C      | Completed in February 2001.   |
| Phase 1 Stream Geomorphic Assessments                             | C/O    | Phase 1 geomorphic assessments completed in the upper Lamoille, the entire Lamoille mainstem, the Wild Branch, Elmore Branch, Gihon River, Browns River, North Branch, lower Lamoille, and many smaller tributaries.  |
| Phase 2 Stream Geomorphic Assessments                             | C/O    | Phase 2 geomorphic assessments have been completed in the upper Lamoille, Browns River, Gihon, Centerville Brook, Lamoille River, Elmore Branch, and Wild Branch sub-watersheds.  |
| Bridge and Culvert Inventory                                      | C      | Bridge and culvert surveys have been completed in the entire upper Lamoille watershed except for some smaller tributaries.  |
| Dam Inventory   | C      | A dam inventory has been completed for the entire Lamoille watershed.   |
| Biological Monitoring   | C/O    | 2007 was the BASS Lab Lamoille watershed rotation of sampling. Sites sampled included Unnamed tributary to the Brewster River, Gihon River at 2 sites, Wild Branch, and Lamoille River at several sites, Additional macroinvertebrate and fish sampling to better bracket possible sources of pollution and determine long term water quality trends including a focus on Rodman Brook downstream of a closed landfill. |
| Restoration/Protection Projects Underway                          | C/O    | Numerous projects are underway watershed wide (see below).  |

Key: I = initiated, O = ongoing, C= completed

## River & Stream Restoration Projects

| Waterway                                      | Water Quality Concern   | Current Actions  |
|---|---|--|
| Deer Brook, Georgia                           | Impairment from excessive sediment and nutrients  | A remediation design, quantities and cost estimate has been developed.   |
| Browns River, Chittenden County               | Adverse impact by severe streambank instability and erosion                                       | A river corridor management plan is being prepared for the towns of Essex, Jericho, Underhill, and Westford. Developed bridge and culvert capital budgets for several watershed towns.   |
| Unnamed tributary to the Gihon River, Johnson | Stormwater outfalls have created significant gully erosion with excessive sediment to Gihon River | DEC Watershed Coordinator provided technical assistance and construction supervision in the implementation of stone lined waterway and stormwater outfall stabilization which has addressed the water quality problem.   |
| Riparian Buffer Establishment, watershed wide | Lamoille County NRCD's successful <i>Trees for Streams</i> program is being expanded              | Watershed Coordinator is working closely with NRCDs have expanded the successful stream buffer program to two additional counties in the watershed.  |
| Lamoille River, Morristown                    | Agricultural drainage erosion   | Coordinator and VYCC stabilized 300 feet of eroding waterway by installing 3 stone-lined waterways.  |
| Gihon watershed                               | Stormwater-related erosion  | Stabilized an eroding gully with a stone lined waterway at the JSC campus.   |
| Upper Lamoille                                | Logging-related erosion at stream crossings   | Launched the Lamoille Portable Skidder Bridge Project to reduce erosion at stream crossings.   |
| Roads in Walden                               | Erosion and sedimentation from town gravel roads  | DEC Coordinator developed designs and cost estimates for 7 separate projects to address erosion related to municipal road systems. Coordinator also provided technical assistance and construction supervision of 3 implemented road best management projects. |
| Lower Lamoille Wetlands Restoration           | Wetlands have been drained, filled, and degraded for agricultural and urban land uses             | The lower Lamoille Wetland Restoration project was launched to inventory high priority wetlands for restoration and protection.  |

### Plans for 2008

Plans for 2008 include completing a final draft of the Lamoille River watershed water quality management plan. Public hearings will precede the adoption of a final watershed plan. DEC will continue to proactively identify water quality concerns, initiate watershed improvement projects, and protect high quality sites with help from watershed partners. The Watershed Coordinator will work especially closely with the fledgling Lamoille Watershed Association in its capacity building progress.

Watershed restoration projects are planned in 2008 to:

- Address gully erosion in the impaired Deer Brook watershed,
- Complete of a river corridor management plan and bridge and culvert upgrades for the Browns river,
- Dam removal in the Stevensville Brook watershed,
- Development of a fluvial erosion hazard map for the town of Underhill,
- Continued removal of floodplain encroachments associated with the Lamoille Valley Rail,

- Establishment of riparian buffers along lakes and streams throughout the watershed,
- Road erosion best management projects at 7 sites in the town of Walden,
- Assist additional towns in securing funds for road runoff issues,
- Implementation of stormwater best management practices in the Deer Brook watershed.
- Installation of salt and sand shelters in Belvidere and Cambridge to reduce sediment discharges to the North Branch and Brewster River
- Restore and protect wetlands in the lower Lamoille watershed

Watershed partners include regional planning commissions, natural resource conservation districts, angler groups, the agricultural community, state and federal government agencies, landowners, and municipalities.

## **Winooski River – Basin 8**

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### **Introduction**

The DEC Watershed Coordinator worked closely with numerous watershed partners in 3 separate collaborative efforts in the Upper, Middle, and Lower Winooski watershed. Numerous outreach, restoration, and water quality monitoring efforts were initiated in 2007. New collaborative efforts were established by the Coordinator and partners in the Middle and Lower Winooski watershed with the Friends of the Winooski, Winooski NRCD, YCC, UVM Sea Grant Program, area schools, watershed residents, municipalities, and corporate sponsors to address a wide array of water quality, aquatic habitat, and watershed outreach needs. Noteworthy activities by major category are introduced below:

#### **\*Assessment and Monitoring**

Phase 1 and 2 geomorphic assessments were completed in the following sub-watersheds: Winooski headwaters, Great Brook, Kingsbury, North Branch, Mad River, Little River, and lower Winooski River, Allen, Morehouse, Centennial, Sunderland, and smaller sub-watersheds. Additionally, river corridor planning by the River Management Section was completed in the upper Winooski Town of Marshfield. The DEC BASS Lab completed macroinvertebrate sampling along the Stevens Branch in Barre City at a hazardous waste site and on the Stevens Branch in Barre Town.

#### **\*Urban-related Runoff Restoration and Outreach**

Numerous watershed restoration projects were identified and implemented during the 2007 field season. The Watershed Coordinator assisted the Town of Orange in the design and fund raising to remediate 7 road-related erosion projects. The Coordinator also assisted the Town in the implementation of 2 Better Backroads projects. Trash was removed from 2 miles of the Stevens Branch in Barre City. Two stone-lined waterways were installed along the North Branch in Montpelier. Five rain gardens were installed in the Barre, Berlin, and Montpelier area. The Friends of the Winooski removed trash from the Winooski River and North Branch in the Montpelier area. Sixty rain barrels were distributed to urban landowners. Five timber and stone grade control structures were installed in Barre Town to address gully erosion. An undersized and failing stream crossing was replaced in the Mill Brook watershed in Waitsfield. Seven hundred trees and shrubs were planted along the North Branch and Winooski River in Montpelier by DEC, the City of Montpelier, and VYCC.

#### **\*Agriculture and Logging-related Restoration and Outreach**

Two major volunteer riparian buffer projects were implemented on agricultural lands along the Winooski River in the Towns of Cabot and Marshfield covering nearly 2 thousand linear feet. The Winooski NRCD initiated a cover crop program along the Mid Winooski River.

#### **\*Impaired Waters Remediation**

Eight additional grade control structures were installed in the impaired Allen Brook watershed in Williston.

### **Watershed Initiatives**

| Activity                        | Status | Comments/Information  |
|---------------------------------|--------|---|
| Public forums held              | I      | A series of public forums were held at the onset of basin planning in the mid and upper watershed.  |
| Watershed Council formed        | I      | Initial Councils were formed at the sub-watershed level in the mid and upper watershed assisted DEC in the development of a draft watershed plan. |
| Local water quality (WQ) issues | I      | Top local water quality issues were identified in the mid and upper   |

|   |     |   |
|---|-----|---|
| identified  |     | watershed.  |
| Panel discussions on WQ issues held                               | I   | Some issues discussed in the Winooski Community Headwaters Project group.   |
| Strategies for WQ issues formed                                   | C   | The strategies are selected.  |
| Review of town plans and zoning                                   | I   | In early stages.  |
| Develop water management type (WMT) classification proposal       |     |   |
| Meetings with individual towns on the WMT classification proposal |     |   |
| Draft basin plan  | I   | In early development  |
| Public hearings on draft plan                                     |     |   |
| Final basin plan  |     |   |
| Outreach to area schools and local groups                         | O   | Educational programs presented at Winooski Headwaters Festival, Two Rivers Festival, YCC crew members, landowners, and municipalities.  |
| Basin Assessment Report   | O   | Scheduled for completion in 2008.   |
| Phase 1 Stream Geomorphic Assessments                             | C/O | Phase 1 geomorphic assessments completed in the Winooski headwaters, Great Brook, Kingsbury, North Branch, Mad River, Little River, and lower Winooski River, Allen, Morehouse, Centennial, Sunderland, and smaller sub-watersheds. |
| Phase 2 Stream Geomorphic Assessments                             | C/O | Phase 2 geomorphic assessments have been completed in the Winooski headwaters, Great Brook, Kingsbury, North Branch, Mad River, Little River, Allen, Morehouse, Centennial, Sunderland, and lower Winooski sub-watersheds.          |
| Bridge and Culvert Inventory                                      | C   | Bridge and culvert surveys have been completed in the much of the upper and mid watershed except for some smaller tributaries.  |
| Dam Inventory   |     |   |
| Biological Monitoring   | C/O | Marcroinvertebrate sampling completed at 2 sites in the Stevens Branch watershed.   |
| Restoration/Protection Projects Underway                          | C/O | Numerous projects are underway watershed wide (see below).  |

Key: I = initiated, O = ongoing, C= completed

## River & Stream Restoration Projects

| Waterway                   | Water Quality Concern           | Current Actions  |
|----------------------------|---------------------------------|--|
| Winooski River, Cabot      | Lack of riparian buffer         | A riparian buffer was established along several hundred feet along the Winooski in Cabot.  |
| Winooski River, Marshfield | Lack of riparian buffer         | A riparian buffer was established along several hundred feet along the Winooski on land owned by the Town of Marshfield.   |
| Stevens Branch, Barre City | Trash in river                  | Coordinated a trash clean up of 2 miles of stream in Barre City with YCC.  |
| Honey Brook, Barre Town    | Gully erosion and sedimentation | Coordinated and designed the implementation of 5 timber and stone grade control structures to address gully erosion. Coordinator also provided the Town with technical assistance in the implementation of several road best management practices to address flooding related erosion. |
| Stevens Branch watershed   | Catastrophic road flooding      | Coordinator provided technical assistance to Barre Town in pre and post flood remediation.   |

|  |  |  |
|--|--|--|
| North Branch & Winooski River Montpelier   | Lack of riparian buffer and gully erosion          | Coordinated the planting of riparian trees, shrubs, and cuttings and installed 2 stone lined waterways along the North Branch with YCC and City of Montpelier. |
| Winooski River & Stevens Branch watersheds | Urban runoff                                       | Distributed 60 rain barrels to urban residents and provided education to 2 school groups.  |
| Winooski River & Stevens Branch watersheds | Urban runoff                                       | Installed 5 rain gardens in the Barre, Berlin, and Montpelier areas with watershed partners.   |
| Allen Brook, Williston                     | Gully erosion and sedimentation                    | Coordinated the implementation of 8 stone and timber grade control structures with YCC to address gully erosion in this impaired waterway.                     |
| Lower Winooski Initiative                  | Urban runoff in Chittenden County                  | Coordinator initiated an innovative new collaborative outreach, restoration, and monitoring effort with watershed partners.                                    |
| Jail Branch, Orange                        | Road-related erosion                               | Coordinator provided technical assistance and construction supervision in the implementation of 2 Better Backroads projects to reduce erosion.                 |
| Mill Brook, Waitsfield                     | Undersized stream crossing, fluvial erosion hazard | Coordinator provided technical assistance and construction supervision in the replacement of significantly undersized and failing stream crossing.             |

## Plans for 2008

The Watershed Coordinator position, vacant since April 2007, will be filled in December 2007. One Watershed Coordinator will be responsible for basin planning in the upper Winooski watershed (i.e. Bolton Falls upstream) while another Watershed Coordinator will be responsible for basin planning in the lower Winooski watershed. The Watershed Coordinators will continue to work closely with watershed partners in 3 separate collaborative partnership efforts in the Upper, Middle, and Lower Winooski watershed. The three partnership efforts will focus on:

- Watershed resident outreach,
- Riparian buffer establishment,
- River corridor protection and easements,
- Reducing urban runoff,
- Remediation work in the impaired waters,
- And volunteer water quality monitoring efforts.

In addition to the basin planning efforts, examples of projects to be implemented in 2008 include river trash clean ups, the installation of several rain gardens, the distribution of rain barrels, pharmaceutical and personal care product sampling and outreach campaign, and additional Phase 2 geomorphic assessments and river corridor planning.

The Coordinators will continue to provide technical assistance to municipalities to reduce river-road related conflicts and erosion hazards and implement additional road best management practices to reduce road-related erosion.

## White River - Basin 9

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### Introduction

The Agency of Natural Resources adopted the water quality management plan for the White River basin in November 2002. The Vermont Water Resources Board (now Panel) held public hearings in February 2005 and subsequently approved the Agency's water management typing and classification proposal for surface waters in the basin. The Legislative Committee on Administrative Rules (LCAR) reviewed the Board's proposed rule, but has not approved them. At LCAR's request, parties opposing the proposal, the Agency and the Board are all in discussions to develop a revised proposal, including a process for developing future typing and classification proposals.

The White River Basin Plan differs from other planning efforts in that DEC did not form a watershed council in the White River basin, but instead, based the plan on its collaborative work with the White River Partnership and other entities in the watershed. The concept of a separate watershed council guiding the planning process in each watershed did not develop until after the work on the White River Basin Plan was well underway.

The White River Partnership was formed in 1995 as a group of local citizens interested in preserving the quality of life in the White River drainage basin area. It has become and continues to be a forum for bringing together the community, local, state, and federal government agencies, and their resources to protect common interests.

### Watershed Initiatives

| Activity  | Status | Comments/Information   |
|---|--------|--|
| Public forums held  | C      | Four public forums - held in 2000.   |
| Watershed Council formed  | C      | White River Partnership and others served this function.   |
| Local water quality issues identified                             | C      | Top local water quality issues included stream channel instability and streambank erosion, lack of awareness of water quality problems, public access, impacts to fisheries. |
| Panel discussions on water quality issues were held               | C      | Technical staff participated in development of strategies, gave presentations during public hearings.  |
| Strategies for water quality issues formed                        | C      | Strategies were developed to resolve each priority water quality issue.  |
| White papers on WQ issues   | C      | 8 water quality issue fact sheets were developed.  |
| Review of town plans and zoning                                   | C      | All town plans and regulations were reviewed.  |
| Develop water management type (WMT) classification proposal       | C      | A water management typing proposal was developed based on existing, reasonably attainable and desired water quality.   |
| Meetings with individual towns on the WMT classification proposal | C      | Information about the typing proposal went to all watershed towns. DEC met with 17 selectboards and planning commissions, 1 conservation commission.                         |
| Draft basin plan  | C      | Working Draft Fall 2001.   |
| Public hearings on draft plan                                     | C      | Conducted September 2002.  |
| Final basin plan  | C      | Adopted by ANR & published November 2002.  |

|   |   |  |
|---|---|--|
| Outreach to area schools and local groups | C | DEC did outreach throughout planning process. Ongoing outreach by the White River Partnership.   |
| Basin Assessment Report                   | C | An updated report was done in November 2002.   |
| Phase I Stream Geomorphic Assessments     | C | Completed on upper White, First, Second, Third Branches and numerous tributaries.  |
| Phase II Stream Geomorphic Assessments    | C | Completed on many of the rivers and streams for which Phase I was done (see above).  |
| Bridge and Culvert Inventory              |   |  |
| Dam Inventory                             | C | Field inventory done.  |
| Biological Monitoring                     | C | Additional waters sampled (biological monitoring) to bracket possible sources of pollution and determine long-term water quality trends. |
| Restoration/Protection Projects underway  | O | Numerous watershed and restoration projects are underway watershed wide (see below).   |

Key: I = initiated, O = ongoing, C= completed

### River & Stream Restoration Projects

| Waterway                              | Water Quality Concern         | Current Actions  |
|---------------------------------------|-------------------------------|--|
| Ayers Brook                           | Stream bank stability         | Assisted White River Partnership in applying for grant to implement river corridor plan.   |
| Watershed-wide                        | Unstable Streams              | The DEC river management program is working with the White River Partnership to implement river restoration/protection projects in fulfillment of numerous basin plan strategies.            |
| Upper White, Tweed River, Ayers Brook | Stream channel instability    | Prepared project application with endorsement from Governor Douglas that was submitted to USEPA for consideration under the Targeted Watersheds Grant Program. Application was unsuccessful. |
| Watershed-wide                        | Nutrients, sediments, E. coli | DEC provided technical and financial assistance to a volunteer water quality monitoring effort.  |

### Plans for 2008

The Watershed Coordinator will continue to pro-actively initiate watershed improvement projects, and protect high quality sites with watershed partners, state and federal government agencies, landowners, and municipalities in accordance with the adopted White River Basin plan. The Watershed Coordinator will work with the White River Partnership to initiate efforts to begin revising and updating the 2002 Plan. To the extent guidelines or rules are developed, the Watershed Coordinator may also be in a position to revise the petition for typing of waters within the basin.

## Ottauquechee & Black Rivers – Basin 10

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### Introduction

The DEC Watershed Coordinator has begun meeting with watershed groups, municipalities and regional commissions to begin discussions and recruitment of organizations in the watershed council interested in becoming formed for Basin 10.

The Ottauquechee Natural Resources Conservation District (ONRCD) has agreed to be the local contact with landowners and will act as meeting organizer and recorder. The ONRCD has received grant funding to enable them to take on this role. The Agricultural Resource Specialist/Basin Planner with the District has begun working on gathering agriculture-related data to compile the ag chapter of the plan. The ARS and DEC Watershed Coordinator have toured the basin documenting agricultural operations within the basin and making preliminary inquiries regarding potential ag issues in the basin.

Working with the District, the Southern Windsor County Regional Planning Commission and the Black River Action Team, a Japanese knotweed management and control project has been implemented along the Black River in the towns of Springfield and Ludlow. Demonstration projects, outreach materials and an educational workshop will help landowners identify and control this highly invasive riverbank plant.

The Phase 1 Stream Geomorphic Assessments of the Black River mainstem and significant tributaries has been completed and Phase 2 assessment is underway.

### Watershed Initiative Status

| Activity                            | Done | Comments/Information   |
|-------------------------------------|------|--|
| Public forums held                  | I    | Planning to begin forums is in progress.   |
| Watershed Council formed            | I    | In Progress.   |
| Local WQ concerns identified        | I,O  | Local watershed group (Black River Action Team) and watershed residents are expressing concerns for particular waterbodies and issues. |
| Panel discussions on WQ issues held |      |  |
| Strategies for WQ issues formulated |      |  |
| Draft white papers for WQ issues    |      |  |
| Review of town plans and zoning     | I,O  |  |
| Develop water                       |      |  |

|   |     |   |
|---|-----|---|
| management type classification proposal                       |     |   |
| Meetings with individual towns on WMT classification proposal |     |   |
| Watershed plan draft  |     |   |
| Public hearings on draft plan                                 |     |   |
| Final basin plan  |     |   |
| Outreach to area schools and local groups                     |     |   |
| Basin Assessment Report completed                             | I,O | Basin in current rotation for new assessment report.                          |
| Stream Geomorphic Assessments                                 |     | Phase 1 SGA underway on the Black River mainstem and significant tributaries. |
| Bridge and Culvert Inventory (B&C)                            | I,O |   |
| Dam Inventory   |     |   |
| Biological Monitoring   | I,O | BASS monitored in 2007 for assessment rotation.                               |
| Restoration/Protection Projects Underway or Completed in 2007 | I,O | Projects in Hartland, Reading, Springfield have been initiated.               |

Key: I = initiated, O = ongoing, C= completed

## River and Stream Restoration Projects

| Waterway                          | Water Quality Concern                   | Current Actions   |
|-----------------------------------|---|---|
| Black River                       | Litter, pollutants                      | Black River RiverSweep Clean-Up day organized by BRAT in cooperation with the CT River Watershed Council (C, annually)                          |
|                                   | Japanese knotweed                       | Outreach and control program in progress.   |
|                                   | Pollutants                              | Initiating school-based WQ monitoring program by BRAT.  |
| Lake Rescue (Round Pond)          | Sedimentation                           | Working with Lake Rescue Asso., Lakes & Ponds Div., & Better Backroads Program to identify sources of sediment and address road erosion issues. |
| Monument Run (Black River trib)   | Bank erosion                            | Buffer planting by BRAT.  |
| Ottaquechee River (Fulling Brook) | Erosion of public trail entering stream | Working with ONRCD and landowners to repair gully and fix road runoff causing problem.  |
|                                   | Forest Mgmt Practices                   | Educational workshop on forests and WQ for landowners.  |

## Plans for 2008

Form Watershed Council and begin public forums on planning issues. Make progress on various activities shown on watershed initiative status table (above).

## West, Williams & Saxtons Rivers – Basin 11

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### Introduction

The Draft Basin 11 Water Quality Management Plan has been completed and is being released for public review and comment. The plan contains 61 strategies and over 150 actions being recommended for implementation.

Stream geomorphic assessments are taking place throughout the basin. On the West River, Phase 1 and 2 are being completed. The Rock River Corridor Plan is underway following completion of the Phase 1 & 2 reports. For Ball Mountain Brook all three levels of assessment are complete and projects are being evaluated for implementation. And the phase 1 and 2 assessments on the Saxtons River are underway.

Plan strategies being implemented by DEC and local partners include the water quality monitoring program, work with towns to locate and control bacteria contamination and septic system education and outreach by the West River Watershed Alliance; buffer plantings and farmer outreach by the Windham County NRCD, aquatic invasives surveys and milfoil control by the Town of Brattleboro and DEC, and an application for grant funding to do feasibility study of proposed Rock River access projects;

Water Management Typing has been completed for all 29 towns in Basin 11. Meetings on typing have been completed with ten towns however further meetings have been postponed pending needed decisions by the Water Resources Panel.

### Watershed Initiatives

| Activity                            | Done | Comments/Information  |
|-------------------------------------|------|---|
| Public forums held                  | C    | Over 240 public forums, Council meetings and partner meetings have taken place over the life of the planning process.   |
| Watershed Council formed            | C    | First meeting held April 1, 2004. Council members have been and continue to be part of all public forums.   |
| Local WQ concerns identified        | C    | The 5 top WQ concerns identified by the watershed council are thermal modification, sedimentation, habitat alteration, flow alteration and pathogens.                               |
| Panel discussions on WQ issues held | C    | Special topic focus groups presented reports to the Watershed Council who examined issues and proposed solutions. The public was invited to attend and participate in all meetings. |
| Strategies for WQ issues formulated | C    | 61 strategies and over 150 actions steps have been written to address identified WQ concerns  |
| Draft white papers for WQ issues    | C    | Focus group and RTD recommendations have been integrated into the draft basin plan.   |
| Review of town plans and zoning     | C    | A table listing all towns and pertinent laws and regulations is included in the appendix to the plan  |

|   |       |   |
|---|-------|---|
| Develop water management type classification proposal         | C     | Water Management Typing has been completed for all 29 towns in Basin 11.  |
| Meetings with individual towns on WMT classification proposal | O     | 10 of the 29 basin towns have had WMT presentations and discussions. Further meetings have been postponed pending needed decisions by the Water Resources Panel.  |
| Watershed plan draft  | C, O  | The Draft Plan is completed and public meetings are being schedule for January of 2008.   |
| Public hearings on draft plan                                 | I     | Scheduled for January 2008  |
| Final basin plan  |       | Scheduled for February 2008.  |
| Outreach to area schools and local groups                     | C, O  | WRWA is major partner in basin planning and is doing outreach work to towns and local groups. WCNRCDC has a Basin Planning website and offers workshops in water quality related land management topics. Watershed coordinator offers presentations to towns, groups, schools and others. |
| Basin Assessment Report completed                             | C     | Information incorporated and referred to in the Basin 11 draft plan.  |
| Stream Geomorphic Assessments done                            | C, O  | West River, Phase 1 complete and 2 are being completed. Rock River Phase 1 & 2 reports complete, Corridor Plan underway. Ball Mountain Brook Phase 1 & 2 and Corridor Plan complete, projects are being evaluated for implementation. Saxtons River Phase 1 and 2 assessments underway.   |
| Bridge and Culvert Inventory (B&C)                            | C, O  | Completed where Phase 2 assessments done and The Nature Conservancy completed a B&C assessment of ~ 400 structures on the West River.   |
| Dam Inventory   | I     | State inventory provides information for larger impoundments. Dam Focus group has recommended survey of small dams in Basin 11.   |
| Biological Monitoring   | O     | WRWA carrying out basin-wide monitoring program annually. State biological monitoring is on-going in areas of Basin 11 – as described in the Basin 11 Watershed Assessment 2001.  |
| Restoration/Protection Projects Underway or Completed in 2007 | I,C,O | Projects are being carried out throughout the basin.  |

Key: I = initiated, O = ongoing, C= completed

## River & Stream Restoration Projects

| Waterway   | Water Quality Concern  | Current Actions  |
|------------|--|--|
| West River | Agricultural runoff  | Trees for Streams program by WCNRCDC – buffer planting on agricultural lands                           |
| West River | Aquatic Nuisance Species   | Retreat Meadows aquatic invasive species control outings and public education seminars offered (C,O)   |
| West River | Litter, pollutants   | West River Clean-Up day organized in cooperation with the CRWC and conducted by WRWA volunteers.(C, O) |
| West River | Bacterial contamination  | Educational Kiosks – on-going water quality monitoring postings by WRWA volunteers. (C, O)             |
| Basin-wide | <i>E. coli</i> , nutrients, sediment                             | WRWA Water Quality monitoring program (C, O)   |
| Basin-wide | Nutrients, sediment, geomorphic instability, habitat degradation | Macroinvertebrate sampling and processing program (O)  |

## **Plans for 2008**

Hold public comment meetings, finalize plan and submit final basin 11 water quality management plan to ANR Secretary for adoption.

Proceed with presenting final water management typing and classification recommendations to towns in a form and manner determined by the Water Resources Panel.

Carry out feasibility study of Rock River access projects.

Complete stream geomorphic assessments that are in progress and proceed to corridor planning where necessary.

Implement Ball Mountain Brook restoration projects with willing landowners.

## Deerfield River - Basin 12

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### Introduction

The basin planning process has not started in this drainage basin area. The Watershed Coordinator, hired in November 2006, is currently working on the development of the water quality management plan for the basin #1 area. Upon development of the basin 1 plan, the Coordinator will then focus on the Deerfield River.

Although there has been no formal planning process within this basin area, the Coordinator has worked to make contacts with local officials, community organization, the regional planning commission and natural resource conservation district. Through this outreach, the Coordinator, along with community partners, continues to identify, develop, and scope potential water quality projects throughout the basin. These partnerships will continue in 2008. The basin planning process will only benefit from the work that gets done prior to initiation of the basin planning process and create a smoother transition to the official plan development.

Projects completed throughout the basin include: working with the Appalachian Mountain Club on a Deerfield River User Guide and Map (map provides historic information on the management of waters throughout the Deerfield River and the recreational facilities available for the use and enjoyment of the public); the Windham County Natural Resource Conservation District developed and produced an educational watershed placemat for the local restaurants (the placemat provides information on potential sources of nonpoint sources of pollution throughout the basin and how community members can take steps to prevent these sources of pollution for entering local waters). Both of these resources will provide community members information about local waters and will benefit the basin planning process in the years that follow.

### Watershed Initiatives

| Activity  | Status | Comments/Information |
|---|--------|----------------------|
| Public forums held  |        |                      |
| Watershed Council formed  |        |                      |
| Local water quality (WQ) issues identified                        |        |                      |
| Panel discussions on WQ issues held                               |        |                      |
| Strategies for WQ issues formulated                               |        |                      |
| Review of town plans and zoning                                   |        |                      |
| Develop water management type (WMT) classification proposal       |        |                      |
| Meetings with individual towns on the WMT classification proposal |        |                      |
| Draft basin plan  |        |                      |
| Public hearings on draft plan                                     |        |                      |

|   |     |   |
|---|-----|---|
| Final basin plan                          |     |   |
| Outreach to area schools and local groups |     |   |
| Basin Assessment Report                   | C   | Completed - March 2003.   |
| Phase I Stream Geomorphic Assessments     | C/O | The Phase I SGA assessment work was completed on the North Branch of the Deerfield River in 2006. |
| Phase II Stream Geomorphic Assessments    | C/O | The Phase II assessment work on the North Branch of the Deerfield River was completed in 2006.    |
| Bridge and Culvert Inventory              | I/O |   |
| Dam Inventory                             |     |   |
| Biological Monitoring                     | O   | BASS Lab monitoring programs.   |
| Restoration/Protection Projects Underway  |     |   |

Key: I = initiated, O = ongoing, C = completed

### River & Stream Restoration Projects

| Waterway        | Water Quality Concern   | Current Actions  |
|-----------------|---|--|
| Deerfield River | Increased recreational use increased the potential for misuse. AMC developed an wise use recreation guide for the Deerfield River | The user guide and maps are available for local organization, community facilities, recreation guide and local retail outfitters.                                  |
| Deerfield River | The WCCD developed and distributed the Deerfield River Educational Placemat at local restaurants.                                 | The placemats will be in circulation in early 2008 throughout the local restaurants in the Deerfield Basin.  |
| Deerfield River | Aquatic Invasive Species are a continual threat to water quality throughout the state.  | The Watershed Coordinator worked with TransCanada External Relations director to post all the boat launches with ANR Aquatic Invasive Species informational signs. |

### Conclusion & Plans for 2008

The Watershed Coordinator will continue to facilitate outreach to community members, the regional planning commissions, natural resource conservation district and local watershed organizations. In an effort to develop community involvement in the basin planning process, the Watershed Coordinator will scope potential projects, research grants and develop community partnerships. The basin 12 planning process may kick off as early as 2009 with a host of informal public forums to solicit community participation and develop a list of concerns and interests in local water quality.

## Various drainages emptying into Lower Connecticut River – Basin 13

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### Introduction

Although the basin planning process is not scheduled to begin in the Lower Connecticut River basin until no earlier than 2009, the DEC Watershed Coordinator has been working with local watershed groups and municipalities to address issues of concern to water quality.

Stream geomorphic assessments are being carried out on two streams in the Brattleboro area. Crosby Brook is listed in the 2006 303(d) List of Impaired Waters for a sediment impairment, and flooding of the Whetstone Brook is an on-going hazard. A stream geomorphic assessment is also planned for Hubbard Brook in Windsor.

Active projects and taking place in Brattleboro, West Brattleboro, Dummerston and Windsor. Crosby Brook, a 303(d) listed impaired stream has active planning and collaboration work going on between DEC, VAOT, and the towns of Brattleboro and Dummerston to address the sediment impairment in the stream. AOT has agreed to repair a major eroded gully that is contributing significant amounts of sediment and also will do drainage work along I-91. The towns are working on road erosion issues and grant funding is being sought to implement further projects.

The Whetstone Brook through West Brattleboro has been the focus of intense work by DEC, the town and the WCNRC. The town has adopted interim zoning to ban development in the floodplain until SGA work and planning are complete and detailed flood hazard mapping can be used to determine future developable areas. An outreach program is being developed to teach about floodplain management issues.

### Watershed Initiative Status

| Activity  | Done | Comments/Information   |
|---|------|--|
| Public forums held                                    |      |  |
| Watershed Council formed                              |      |  |
| Local WQ concerns identified                          | I,O  | Local watershed group and watershed residents are expressing concerns for particular waterbodies and issues.   |
| Panel discussions on WQ issues held                   | I,O  | Meetings are being held to address specific WQ concerns on Crosby, Whetstone and Hubbard brooks and Mill Pond. |
| Strategies for WQ issues formulated                   | I,O  | Strategies are being developed and projects are being proposed, some will be implemented in 2008.              |
| Draft white papers for WQ issues                      |      |  |
| Review of town plans and zoning                       | I    |  |
| Develop water management type classification proposal |      |  |
| Meetings with individual                              |      |  |

|   |     |  |
|---|-----|--|
| towns on WMT classification proposal                          |     |  |
| Watershed plan draft  |     |  |
| Public hearings on draft plan                                 |     |  |
| Final basin plan  |     |  |
| Outreach to area schools and local groups                     | I,O | Outreach on issues is being done by DEC, WCNRCD, and WRWA.                 |
| Basin Assessment Report completed                             | O   |  |
| Stream Geomorphic Assessments                                 | I   | Phase 1 & 2 SGA and Corridor Planning being initiated on selected streams. |
| Bridge and Culvert Inventory (B&C)                            |     |  |
| Dam Inventory   |     |  |
| Biological Monitoring   |     |  |
| Restoration/Protection Projects Underway or Completed in 2007 | I   |  |

Key: I = initiated, O = ongoing, C= completed

## River and Stream Restoration Projects

| Waterway         | Water Quality Concern     | Current Actions  |
|------------------|---------------------------|--|
| Crosby Brook     | Road runoff - erosion     | Black Mountain Road maintenance and repair.  |
|                  | Excess runoff - flow      | Stormwater system survey.  |
| Whetstone Brook  | Flooding                  | Interim zoning banning development in floodplain.  |
|                  |                           | Floodplain outreach program in development.  |
| Hubbard Brook    | Pollutants                | Bacteria monitoring, VOC monitoring planned.   |
|                  | Sedimentation, flooding   | SGA underway.  |
| Mill Pond        | Invasives, wetland damage | Milfoil control underway, work with landowners on access control, wetland restoration being planned. |
| Commissary Brook | Mass failure – erosion    | TBD  |

## Plans for 2008

Continue responding to local requests for assistance with water quality concerns.

Continue organizing outreach and coordination meetings on Crosby Brook.

Continue working with the Town of Brattleboro on final zoning ordinances for FEH, NFIP and impervious surfaces.

Complete floodplain outreach program development, offer programs and distribute materials throughout Whetstone Brook watershed.

## **Wells, Waits, Stevens & Ompompanoosuc Rivers – Basin 14**

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### **Introduction**

A draft water quality management plan for Basin 14 was completed in 2007 working closely with four watershed councils representing each of the Waits, Wells, Ompompanoosuc and Stevens river watersheds. Twenty watershed council meetings were held in these four watersheds to put the finishing touches on the draft plan and to plan a number of ongoing water quality assessments, projects and outreach efforts.

The Watershed Coordinator worked closely with the Ompompanoosuc River Watershed Council to identify sources of E.coli causing swimming use impairment of the Ompompanoosuc River in West Fairlee and Thetford. While results this year did not clearly identify a source, the council is putting in a proposal to fund microbial source tracking and, with the assistance of the Watershed Coordinator, is following up on a few potential sources in the watershed. In addition, the Watershed Coordinator worked with the Stevens River watershed council to complete sediment and phosphorus storm event sampling in the Stevens River Watershed and worked with the Wells River Watershed Council and Blue Mountain School to initiate a volunteer monitoring program on the Wells River.

The Watershed Coordinator has been working closely with the Waits River Watershed council in completing a Phase 1 and a partial Phase 2 geomorphic assessment of the Waits River. Streambank erosion and the widening of the river resulting in increased temperatures and poor fish habitat has been a top concern in the watershed and the geomorphic assessment should help to address these issues and result in the identification and completion of a number of river restoration and protection projects. The Coordinator worked with partners in the Ompompanoosuc River watershed to develop a proposal to complete a Phase 1 assessment of the Ompompanoosuc River.

In addition to planning and monitoring, the Watershed Coordinator worked with local groups to implement projects in the watershed. One of these projects was a culvert replacement in Groton funded through a Clean and Clear grant. This project replaced a culvert identified by a bridge and culvert assessment as causing geomorphic instability and at high risk for washing out. In addition, the Watershed Coordinator worked with members of the Corinth Conservation Commission to plant trees along the South Branch of the Waits River.

There were also a number of education and outreach efforts completed in the watershed. The Watershed Coordinator led a pair of field trips on the fluvial geomorphology of the Waits River as a component a geomorphic assessment in progress in this watershed in cooperation with the Corinth and Bradford Conservation Commissions and Waits River Watershed Council. The Coordinator worked with the Ompompanoosuc River Watershed Council to present results from volunteer E. coli monitoring at a public meeting.

### **Watershed Initiatives**

| Activity                        | Status | Comments/Information   |
|---------------------------------|--------|--|
| Public forums held              | C      | Five public forums were held in 2004.                                  |
| Watershed Council formed        | C      | Watershed Councils were formed in 2004 in each of the four watersheds. |
| Local water quality (WQ) issues | C      | Local water quality issues have been identified in each of             |

|   |     |   |
|---|-----|---|
| identified  |     | the four watersheds.  |
| Panel discussions on WQ issues held                               | C   | Panel discussions were held in 2004 & 2005.   |
| Strategies for WQ issues formulated                               | C   | Strategies for all major water quality issues have been formulated.   |
| Review of town plans and zoning                                   | C   | Town plan and zoning regulations have been reviewed.  |
| Develop water management type (WMT) classification proposal       | O   | Initiated but on hold until the process for WMT is resolved.  |
| Meetings with individual towns on the WMT classification proposal |     | On hold until the process for WMT is resolved.  |
| Draft basin plan  | C   | The compilation of draft white papers into draft plans is largely complete but significant editing is still required.   |
| Public hearings on draft plan                                     |     | Meetings planned for early 2008.  |
| Final basin plan  |     | To be completed by early to mid 2008.   |
| Outreach to area schools and local groups                         | O   |   |
| Basin Assessment Report   | C   | Basin assessment report completed in April 1999.  |
| Phase I Stream Geomorphic Assessments                             | O/C | Phase 1 assessments were completed on the Stevens River and Ompompanoosuc West Branch in 2004, and will be completed in the remainder of the Ompompanoosuc River, Waits and Wells Rivers in 2007.   |
| Phase II Stream Geomorphic Assessments                            | O/C | Phase 2 assessments were completed for the Stevens River watershed and West Branch of the Ompompanoosuc River in 2006 and portions of the Waits River in 2007. Funding has been secured for additional Phase 2 assessment work in Waits and Wells Rivers to be completed in 2008. |
| Bridge and Culvert Inventory                                      | O/C | Bridge and culvert surveys were completed in the Stevens River watershed in 2004 and in the Ompompanoosuc River watershed and a portion of the Wells River watershed in 2006. In addition a road inventory was completed for the town of Peacham in 2006.                         |
| Dam Inventory   |     |   |
| Biological Monitoring   |     | Samples taken in the fall of 2007.  |
| Restoration/Protection Projects Underway                          | O   | See below.  |

Key: I = initiated, O = ongoing, C = completed

## River and Stream Restoration Projects

| Waterway      | Water Quality Concern                              | Current Actions   |
|---------------|--|---|
| Wells River   | Turbidity & Phosphorus                             | Watershed Coordinator worked with the Groton Road Commissioner to replace a severely undersized culvert identified through a 604b funded bridge and culvert survey. |
| Waits River   | Elevated water temperatures & poor aquatic habitat | Watershed Coordinator worked with the Corinth Conservation commission to plant trees along the South Branch.  |
| Stevens River | Turbidity & phosphorus levels                      | Watershed Coordinator worked with the Caledonia County NRCD and the Peacham Road Commissioner to identify and implement a number of road improvement projects.      |

## **Conclusion & Plans for 2008**

In 2007, the draft Basin 14 water quality management plan was completed, a number of assessments were completed and projects implemented, and plans were made for future work in 2008.

In 2008, the draft Basin 14 plan will go out for public review and be put forward for adoption in accordance with legislative bill H.73 allowing for the adoption of the basin plan without recommendations for water management typing. Surface water quality testing will continue on the Ompompanoosuc River pending funding availability and may be expanded to include microbial source tracking to attempt to further identify the sources of E.coli so persistent in this watershed. Grants have been secured to continue the geomorphic assessments on the Wells and Waits Rivers and to begin an assessment on the Ompompanoosuc River, and a number of projects will be developed and implemented based on the results of this assessment work and through the implementation of strategies identified in the Basin 14 plan.

## ***Lake Memphremagog, Tomifobia & Coaticook – Basin 17***

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### **Introduction**

The DEC Watershed Coordinator, with assistance from an individual from the Lakes and Ponds Section of the Water Quality Division, has been working to begin the watershed planning process in the watershed drainage area which includes Lake Memphremagog, Tomifobia and Coaticook rivers. A series of meetings were organized early in the year to assist local residents in forming the Memphremagog Watershed Association. This group, which now has over 50 paid members, has elected a board of directors and hosted a number of public educational events over the summer and will be a key partner in the watershed planning process working to implement projects as they are identified.

The DEC Coordinator also hosted a series of five public forums in the watershed to officially kick off the watershed planning process. After these forums, the first watershed council meeting was held in October 2007 and the watershed council for this basin was established with representation from a number of interest groups and residents from across the watershed. The council will be meeting over the winter to discuss water quality assessments which have been completed over the last few years in anticipation of the watershed planning process and to prioritize issues in the watershed to be the focus of the planning process. These efforts have been coordinated closely with international partners in Quebec through the Quebec Vermont Lake Memphremagog Steering Committee, and by coordination with Coseaf, a Quebec watershed group for the St Francis River Watershed that is currently developing separate watershed plans for the Quebec portions of the Lake Memphremagog, Tomifobia River and Coaticook River watersheds.

The Watershed Coordinator, along with other DEC staff and the Memphremagog Watershed Association, cooperated on a number of educational events hosted this summer. The first of these was a presentation on shoreline management practices to benefit water quality and aquatic habitat, and a follow up field workshop to look at a number of shoreline sites and how these could be improved. In addition the Memphremagog Watershed Association and watershed coordinator supported a Vermont Invasive Patrollers training which was well attended by watershed residents. A shoreline restoration project on Lake Memphremagog was also completed as an educational event with the additional partnering of the North Country Union High School AP Science class. Finally, the Watershed Coordinator and Lakes and Ponds staff initiated a lake and shoreline assessment of Lake Seymour with the Lake Seymour association and did a road survey to identify a number of road improvement projects to reduce erosion in this watershed.

## Watershed Initiatives

| Activity  | Status | Comments/Information  |
|---|--------|---|
| Public forums held  | C      | Five public forums were held in 2006 with over 90 individuals participating.  |
| Watershed Council formed  | I      | Watershed Council has been formed and efforts are continuing to expand the geographic and diversity of interests included in the group.   |
| Local water quality (WQ) issues identified                        | C      | A number of water quality issues were identified at public forums in 2007 and will be prioritized in 2008. The Quebec/Vermont Steering Committee on Lake Memphremagog meets twice a year and is working on implementing recommendations from a 1993 joint report "On Managing Lake Memphremagog and its Environment." Basin planning is expected to dovetail with this existing effort. |
| Panel discussions on WQ issues held                               | I      | Two panel discussions have been held in 2007 and a number are being planned for 2008.   |
| Strategies for WQ issues formulated                               |        |   |
| Review of town plans and zoning                                   |        |   |
| Develop water management type (WMT) classification proposal       |        |   |
| Meetings with individual towns on the WMT classification proposal |        |   |
| Draft basin plan  |        |   |
| Public hearings on draft plan                                     |        |   |
| Final basin plan  |        |   |
| Outreach to area schools and local groups                         | O      | Watershed Coordinator made presentations to students from Newport Union High School. Students have been active in the planning process helping to organize a shoreline planting effort and doing publicity on watershed issues.   |
| Basin Assessment Report   | C      | Basin assessment report was completed in 2006.  |
| Phase I Stream Geomorphic Assessments                             | I/C    | Phase 1 assessments were initiated on the Clyde River in 2006 and were completed on the Barton and Johns Rivers in 2007.  |
| Phase II Stream Geomorphic Assessments                            | I/C    | Phase 2 assessments were started in 2006 on the Clyde and in 2007 on the Barton and Johns Rivers.   |
| Bridge and Culvert Inventory                                      | I/C    | DF&W has completed bridge and culvert surveys on portions of the Clyde and Barton Rivers, and NVDA has received a grant to complete an assessment of bridge and culverts in the watershed in 2007/2008.   |
| Dam Inventory   |        |   |
| Biological Monitoring   |        | A presentation of biological monitoring data was made to the watershed council.   |
| Restoration/Protection Projects Underway                          | O/C    | A lakeshore restoration project was completed in 2007 on the shoreline of Lake Memphremagog. NRCS has replaced a failing manure pit along Crystal Brook and will replace a silage bunker in 2008 which should greatly improve this small stream and the larger Johns River.   |

Key: I = initiated, O = ongoing, C = completed

## **Conclusion and Plans for 2008**

The water quality management planning process is off to a strong start in the Lake Memphremagog, Tomifobia and Coaticook rivers basin. A number of public forums were held and a watershed council has formed with representatives from across this watershed and with a diversity of backgrounds.

The watershed council will be hosting a number of panel discussions in 2008 to identify and prioritize issues in the watershed and then to discuss solutions and develop strategies to reduce NPS pollution in this watershed. Working hand in hand with the newly formed Memphremagog Watershed Association, and other partners in the watershed, a number of educational workshops, outreach events and projects are in the works. An example of this is a trash clean up is planned for the spring of 2008 for the South Bay of Lake Memphremagog in cooperation with the Vermont DFP&R and the Memphremagog Watershed Association.